

About this document

This is a scan of the original owners manual found aboard Fays Two (fomerly Suenito), a 32' Downeast Cutter, serial # 321, launched in 1977.

Sections 1 and 2 were not scanned. Section 1 contained warranty procedures and Section 2 consisted of the Master Carpenter's Certificate.

Scott Maxwell
Portland, OR
November 2009

3 SPARS, RIGGING, AND HARDWARE

One of the most rewarding activities connected with sailing is tinkering with your boat's rigging and hardware. The best skippers always seem to be looking aloft at the sails and then thinking about new fittings, or new ways of improving old ones. In this way a person acquires a thorough understanding of how and why every piece of sailing equipment works, plus how to repair and maintain it. As sailors, we too are constantly trying to achieve better and easier boat performance, thus the gear that we install is constantly being improved. What we hope to accomplish in this section is to give you the background information for setting up your boat in the beginning for normal sailing conditions.

When you need more help and information, please consult your local dealer. He is prepared to assist you in obtaining the best type of sailing hardware for your needs in your local area. One may also refer to the annual "Lands End Yachtsman's Equipment Guide". The book should prove invaluable to you and your dealer in the selection of the best additional equipment for your boat. The latest issue may be obtained for a minimal amount (approximately \$2.50) from Lands' End Publishing Corporation, 2241 North Elston Avenue, Chicago, Illinois 60614, and will be an excellent addition to any sailor's library.

- CAUTION -

When placing hardware in any position other than that specified on the Deck Hardware Layout Drawing in Section 3-13, ALWAYS consult the WIRING DIAGRAM to avoid cutting any wires or striking electrical fixtures.

3.1 MAST TUNE

UNDER NO CIRCUMSTANCES SHOULD ANY OF THE RIGGING BE SET UP "BAR TIGHT". FOR ALL SAILING CONDITIONS WE RECOMMEND THAT THE MAST BE RAKED AFT AND IN COLUMN, WITH THE RIGGING "FIRM". IT IS VERY IMPORTANT THAT A KNOWLEDGEABLE PERSON WHO UNDERSTANDS THIS CONCEPT OVERSEES THE INITIAL TUNING OF THE MAST AND RIGGING.

You should be able to stand facing the mast, reach out and pull on any stay and see the mast move in that direction. With a light pull or push by hand at chest height, this dockside starting point will

3-1 MAST TUNE (Continued)

have both stays of equal tension with about 1" to 2" of play in the uppers and 2" to 3" of play in the lowers. The backstay and jib stay should be of equal tension and have about 1" of play. If the mast is stepped on deck the rigging will be tighter than a mast stepped on the keel. With double lowers ? the after lowers will be looser than the forward lowers by about 1" of play. Some of the newer tall rigs have intermediate shrouds, the tension of which should be between that of the uppers and lowers.

On a large mast you may notice a line of rivet heads running up one side of the mast. These hold a 3/4" PVC tube to the inside of the mast for the running of optional instrument wires.

The final tuning of the mast should take place while sailing to windward in a medium breeze of 8 to 10 knots. Sighting along the backside of the mast from deck level will indicate what further turnbuckle adjustment needs to be made to the WINDWARD side of the mast. The top of the mast SHOULD NOT "hook" to windward. In a medium breeze the mast should be straight and this is normally accomplished by taking up on the lower shrouds. ALWAYS TACK, and then make the turnbuckle adjustments on the now LEE or slack side of the mast and then sight the mast on the new, windward side, for further corrections. After a few tacks, the mast should be straight! Secure the rigging by inserting cotter keys into the turnbuckles, spread them open and cover with tape to prevent any snags!

Special attention should be given to the initial stretch of the rigging, especially after the first sail in a strong breeze. In windy conditions it is actually desirable to have the mast head "fall-off" slightly to leeward, giving the mast a smooth, even curve from head to dock. In a tall rig the intermediates play an important part in controlling the upper mast section and this will be especially noticeable in stronger wind conditions. After a few more sails in strong breezes, the rigging should be checked again for tune as additional stretch will occur.

3-2 BACKSTAYS

When racing, the backstay may be tightened to compensate for the extra forward loading applied by the Genoa. At the conclusion of the race it is very important to "slack-off" the amount you "took-up" on the backstay turnbuckle, as this avoids setting up

3-2 BACKSTAYS (Continued)

unnecessary strains on the hull and rig. Since you want to keep the mast straight while racing, you will probably tighten up on the jib stay first so when the backstay is slacked off the mast head will hook slightly forward. When the backstay is tightened up, this "hook" will disappear and the mast will be straight.

Too much tension on the backstay is probably the prime reason for mast and rigging failure. It has been found that tension in the backstay can increase 150% to 200% due to the wind load on the headsail and dynamic loading due to heavy seas. With the optional hydraulic type adjusters (see diagram in Section 3-18) tensions can easily be applied far beyond that which is necessary or safe. The tension on a shroud or stay should not exceed 25% to 30% of the cable's breaking strength at the outside limit. Below are the breaking strengths, in pounds, for 1x19 stainless steel wire cable as supplied by the factory:

3/32" = 1,200	3/16" = 4,700	9/32" = 10,300
1/8" = 2,100	7/32" = 6,300	5/16" = 12,500
5/32" = 3,300	1/4" = 8,200	3/8" = 17,500

On insulated backstays, unless otherwise specified, the upper insulator is located 18" down from the top swage eye, while the lower insulator is 7'6" up from the bottom swage eye.

3-3 YANKEE JIBS

The Yankee Jib is the largest foresail you will need on your Down Easter, as it overlaps the mast and is high cut for good visibility forward. It is identified by the amount of overlap. Thus, if the distance from the face of the mast to the bow ("J" on the sail plan) is 10 feet and a line 15 feet distant (LP) was drawn parallel to the headstay, then any jib top with a CLEW on that line would be a "150% jib top". What is extremely important to realize is that these large sails can concentrate very high loads over a very small area, hence the gear must have high safe working loads. For example: in 25 knots of wind, a jib top is subjected to a pressure of about 4 pounds per square foot, or ONE TON for a 500 square foot jib top.

3-3 YANKEE JIBS (Continued)

Since the above load could easily be transmitted to one spot at any given time, ALL of the Yankee Jib Gear has been designed and prepared to accept those extreme loads. The track is thru bolted and all blocks are oversize. All other fittings are of the best possible design and strength FOR THE JOB INTENDED. Most fitting failures occur from improper usage, usually by trying to use a light or cheap fitting instead of the proper factory recommended one. If loads are expected to come close to the SAFE WORKING LOAD of the block, then the next size larger MUST BE USED. Please remember that if a line turns back on itself, like all halyards, spinnaker sheets, guys, and jib top sheets, then the load on that block is almost DOUBLED.

3-4 REEFING GEAR

Two methods of mainsail reefing, roller and cringle (jiffy reefing), are in common use and their pros and cons could be discussed forever. On boats that have their mainsheet on the end of the boom, there may be a roller reefing mechanism contained in the gooseneck fitting. An optional GEARED ROLLER REEFING GOOSENECK may be installed in which a handle cranks the boom around and the sail is rolled down around the boom.

With mid-boom sheeting, most people will use the optional "Cringle Reef System", which is well illustrated and explained by drawing STD-00-0030 in Section 3-14. This system is quite fast, provides better "sail shape control" than does roller reefing and is definitely recommended for the racing skipper. It is really up to you to figure out if you want to go to roller reefing or cringle reef. After having consulted your own local experts you will know enough so anything we can add would be superfluous!

3-4.1 JIB ROLLER FURLING

This optional item has been included here to draw your attention to the fact that the factory installed Jib Roller Furling IS NOT DESIGNED FOR REEFING THE JIB. Experience has shown that the jib will have a poor shape and can be badly stretched out of shape and torn if an attempt is made to use it partially furled. What we have here is a convenient way to quickly furl ANY HEADSAIL from the cockpit. It is extremely important that when the jib is hoisted IT SHOULD NOT BE HANKED ONTO THE STAY. Only the roller or strap on the crane attached to the upper swivel should be around

3-4.1 JIB ROLLER FURLING (continued)

the headstay. This prevents the halyard from twisting and also gives a fair lead into the jib halyard block.

3-5 BOOM VANG AND MAST HEAD FLY

These two dissimilar but extremely important optional items should be on every sailboat. Its pretty hard to sail if you don't know the wind direction and a mast head fly will always be pointing in the direction the wind is coming FROM. A quick glance aloft will instantly tell you the proper trim for your sails or course change, especially when going downwind when you don't want to gybe.

This brings up the boom vang which will hold the boom horizontal when off the wind, thus keeping the mainsail flat and from bouncing around in light winds and/or a chop. The factory installed boom vang is rigged from the boom to a bail at the base of the mast so it does not have to be down rigged when gybing. This is an added safety feature, since if an accidental gybe were to take place the boom would swing over without lifting up and allowing the leech of the mainsail to catch on the old, leeward spreader. Keep the boom vang slack when going to weather and, when off the wind, set it up tight enough to flatten the mainsail without allowing the leech to "cup" or "hook" inwards.

3-6 PEDESTAL STEERING

The pedestal on the factory installed Pedestal Steering unit is cast from a corrosion resistant aluminum, which is then anodized, primed, and painted with a gloss white polyurethane enamel. All other metal parts are stainless steel, manganese bronze, or bright brass, thus removing any magnetic attraction from around the binnacle mounted compass, which should be adjusted by a professional. Know which are the adjusting screws and then DON'T move them after they have been set.

The steering wheel is varnished teak with a stainless steel rim. The wheel should be covered when not in use to protect the finish.

3-6 PEDESTAL STEERING (Continued)

The unit is virtually maintenance free, but prior to your first sail, climb down below and check out the entire installation. With someone turning the wheel from stop to stop, make sure the cables are leading properly and EVERYTHING is tightened down. Next, sea trails are in order. Check for leaks at the packing gland where the rudder post tube has been cut away to allow for the installation of the quadrant. Now look for freedom of travel in the system and the cable tension. A MODERATE amount, enough to eliminate "backlash" or "play", is recommended, as excessive tension creates added friction and makes for harder steering.

Periodically check for loosened bolts and cable tension, especially after the first few sails. They usually need tightening as the roller chain seats in. Look for signs of wear or "fish hooks" on the cable and replace as necessary. Three or four times a year, depending upon the frequency of use of the boat, lightly oil the chain, pedestal shaft bearings, and sheave bearings with 3-In-One oil to complete your maintenance routine.

3-7 STERN DAVITS AND DINGHY

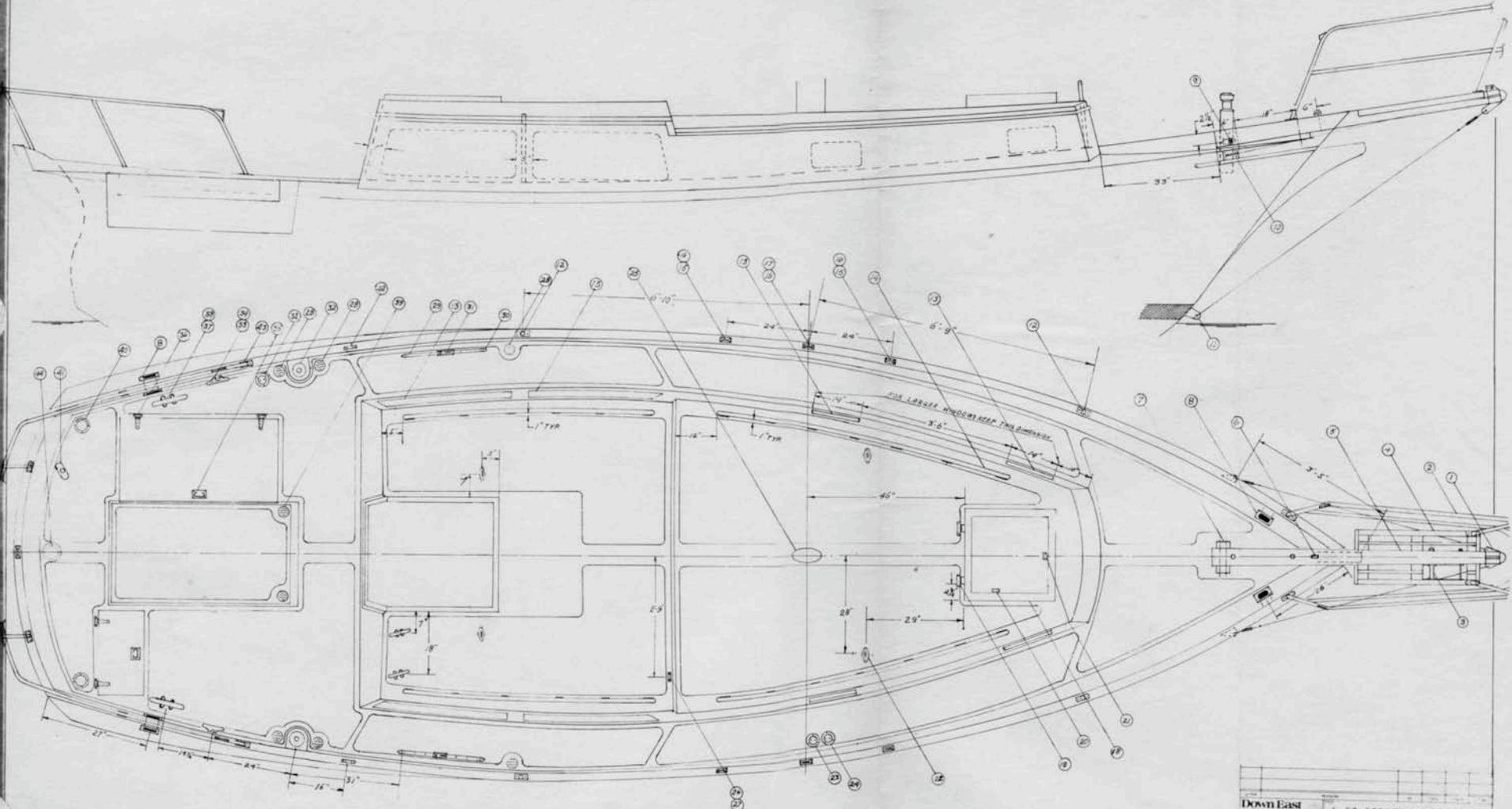
The optional Stern Davits are constructed of stainless steel. They can be easily removed from the chrome plated, cast bronze bases by backing off the four cap screws. The entire installation is very straightforward, but two items should be noted: it is important that the dinghy be provided with a lifting bridle fore and aft and that when the dinghy is hoisted it bears against the rubber stern rub rail of your boat, not the transom. When underway in a rough sea the dinghy must be securely lashed to your boat to keep it from being damaged. If the dinghy has no cover it must have a drain hole (with plug) to allow any rain water to drain out!

*SAIL COVER MAKER
BLINN & YOUNG
645 W. 17TH COSTA MESA*

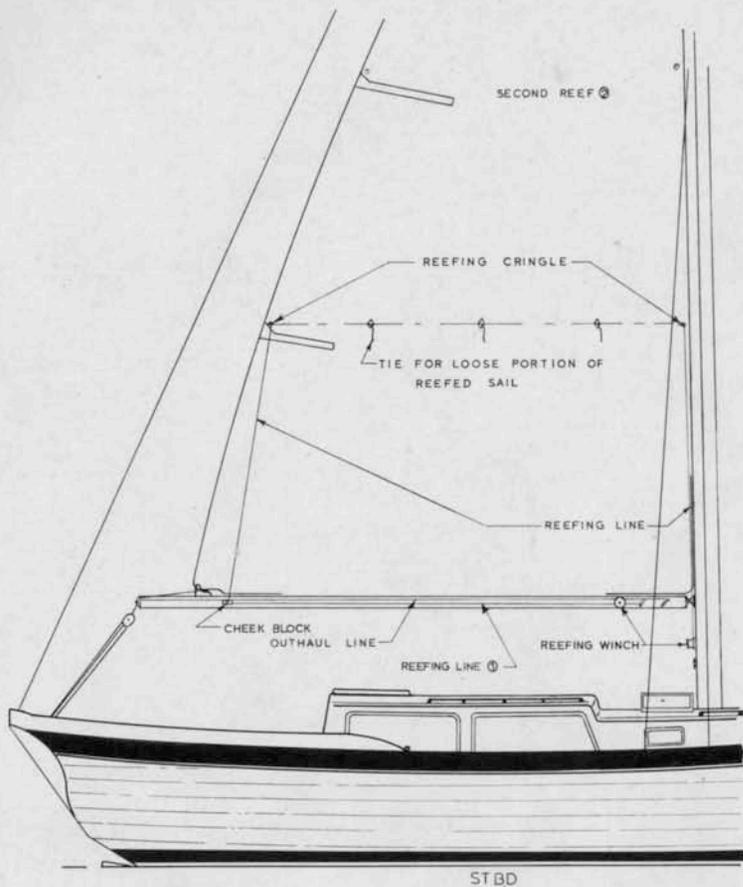
D-32 DECK HARDWARE CUTLER

LIST OF MATERIAL

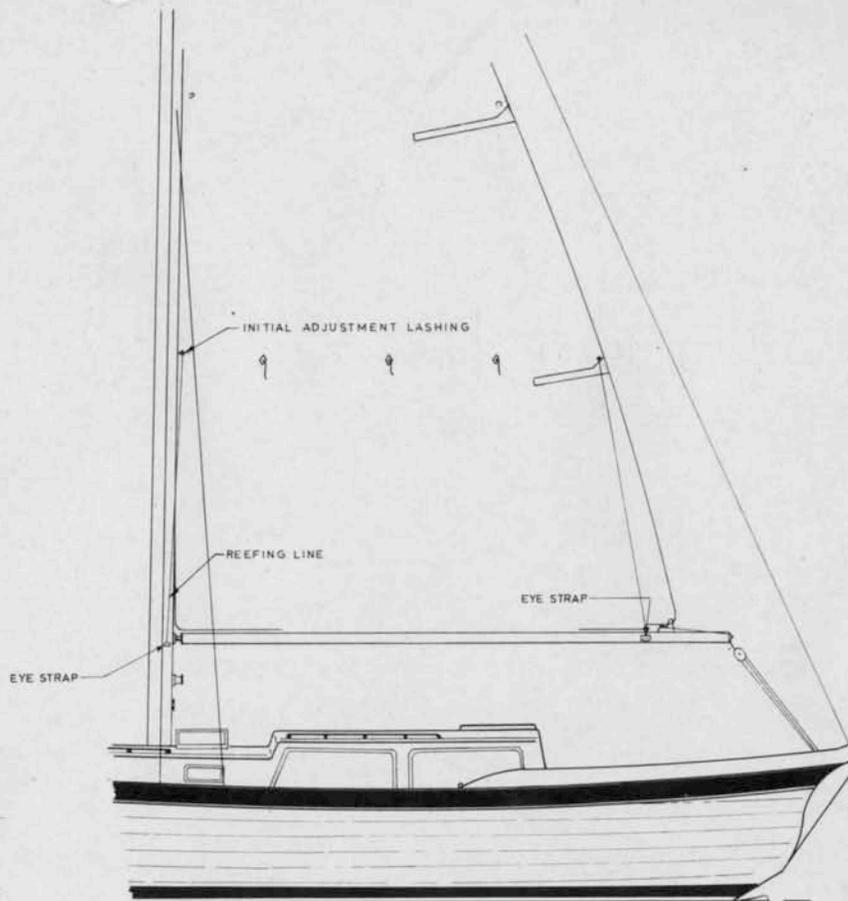
ITEM	QTY	DEY NO	DWG NO	DESCRIPTION	REMARKS	ITEM	QTY	DEY NO	DWG NO	DESCRIPTION	REMARKS	ITEM	QTY	DEY NO	DWG NO	DESCRIPTION	REMARKS	ITEM	QTY	DEY NO	DWG NO	DESCRIPTION	REMARKS		
1	1	33482	D-32-N-2100	EYE PLANT		2	2	34033		DECKPLATE COVER		31	2	34344		SEALER CAB									
2	1	33490	D-32-N-2100	SCREW PLANT		7	2	34017		DECKPLATE UNDER		32	2	34344		BULLHORN HANDLE									
3	1	32749	D-32-N-2100	SCREW ROLLER		18	1	4707		FRONT HATCH		33	2	33731		6" CLEAR									
4	1	4313	D-32-N-2100	SCREW PLATFORM	TEAK	19	1	31243		" " " NINGE		34	2	34181		" " " BACKUP B									
5	1	4303	D-32-N-2100	SCREW PLANT	MS	20	1	33916		SARUNG HUNGULAN		35	2	31551		2" HUNG PERAK 7/8"									
6	1	3403	D-32-N-2100	EYE BOLT		21	1	33922		NETICOLCA		36	2	33018		" " " " " " " " "									
7	2	4304	D-32-N-2100	SCREW PLANT		22	2	33739		PAGEYE		37	2	30980		4" HUNG CLEAR									
8	2	33816		NETICOLCA		23	1	33740		DECKPLATE (UNDER)		38	2	34176		" " " " " " " " "									
9	1	33817		NETICOLCA	STEEL GRAB	24	1	33790		" " " " " " " " "		39	2	43038		CELEST DRIN									
10	2	33818		NETICOLCA	PORT GRAB	25	1	4109		MIST STEER		40	2	33796		SCREW PLANT									
11	1	33745	D-32-N-2100	SCREW PLANT		26	1	32592		FORWARD		41	1	31576		BACKUP ON BURNER									
12	4	34431	D-32-N-2100	STRANCHON		27	1	34178		" " " " " " " " "		42	2	34100		EYE STRAP									
13	1	3443		STRANCHON		28	4	33847		DECK DRIN		43	1	24432		D-32-N-2100 STEER PLANT	OPTIONAL								
14	1	4305		STRANCHON		29	2	34187		T. TRACK		44	1	32421		DECKPLATE 3"	"								
15	4	3448	D-32-N-2100	SCREW PLANT LEMBA		30	2	34106		" " " " " " " " "															



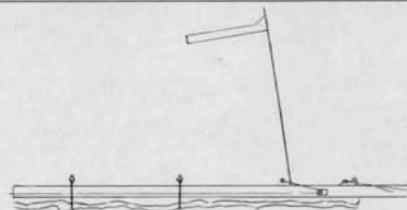
Down East
 1-52 DECK HARDWARE CUTLER
 D-32-14-1000



STBD



PORT



DETAIL: AFT END OF BOOM WITH REEFED SAIL

- 4 CHECK THE OPTIONAL EQUIPMENT LIST FOR HARDWARE INCLUDED IN THE CRINGLE REEFING OPTION.
- 3 CRINGLE REEFING IS QUICK AND SIMPLE, MAINTAINS AN OUTHAUL AND SAIL SHAPE WHILE REEFED.
- 2 A SECOND REEF POINT CAN BE ADDED. POSITION OF THE ADDITIONAL EYE STRAP AND CHEEK BLOCK IS DETERMINED BY THE POSITION OF THE ADDITIONAL REEFING CRINGLE.
- 1 STRING IS LEFT IN SAIL IN PLACE OF HEAVY REEFING LINE AND IS USED TO PULL REEFING LINE THROUGH WHEN NEEDED.

NOTE:

A	SEE EQ.	M M	7-13-77	gw	0457
	ISSUE		1-14-75		0125
LETTER	REVISION	BY	DATE	CHECK	S.D. NO.
Down East Yachts Inc.		REEFING . CRINGLE			
DRAWN BY	DATE APPROVED	DATE	SCALE	DWG NO.	PAGE 1 OF 1
	1-75	1/24/75	NONE	STD-00-0010	

4 ELECTRICAL SYSTEMS

It is important to remember that your BASIC CIRCUIT BREAKER ELECTRICAL SYSTEM may be altered to conform to the electrical requirements of your engine and additional optional accessories. The wiring diagram in this section must, in some cases, be augmented by the specific engine wiring diagram that appears in the Engine Section of this manual. Also note that the description of any special optional electrical accessory (i.e. electric bilge pump) will be found in another, more appropriate section (Plumbing) yet may appear in this section's wiring diagram or the engine wiring diagram. In the event you make any electrical modifications to your boat be sure that you follow the WIRING DIAGRAM or consult a competent MARINE ELECTRICIAN. Boat wiring is considerably different from house wiring due to the marine environment and other conditions not associated with houses. Marinetics will also provide you with additional equipment if you wish to increase your system's capability.

4-1 BASIC CIRCUIT BREAKER ELECTRICAL SYSTEM

The Master Power Control Panel features integrated, simplified controls and circuit breaker protection to permit safe and efficient operation of your boat's electrical equipment. All panel components have been carefully selected for their proven performance in marine applications. The basic panel is of a metal alloy which is inherently corrosion resistant and is doubly protected to optimize resistance to the effects of the marine environment. A one year warranty will be validated by Marinetics Corporation, P. O. Box 1015, Newport Beach, California 92663, if the enclosed warranty registration form is submitted within 30 days from the date of commissioning.

Electrical current is directed from a 12 volt, 105 amp battery or batteries through the Master Power Control Panel for engine starting, battery charging, and accessory loads.

While the standard installation is one battery, many owners do considerable cruising and "living aboard" so a second battery may be added to meet these additional electrical requirements. Panel selection of "BAT 1" or "BAT 2" determines which of the two batteries will be utilized for engine starting and subsequent charging. Before activating the electrical system, use the Battery Condition Indicator to ascertain the condition of your batteries.

4-1.1 BATTERY CONDITION INDICATOR

This type of "indicator" or "meter" is technically referred to as a "Supressed Zero Voltmeter". Note that calibrations do not start at zero but provide a full scale reading from 8 to 10 to 16 volts, depending on the meter. Below 8 or 10 volts the battery charge is so low that terminal voltage readings are meaningless. Approximate voltage range interpretations are as follows:

Engine Not	)	Below 11	. . . . .	Very low battery charge
Running or	)	11 - 12	. . . . .	Low battery charge
at Idle	)	12 - 13	. . . . .	Well charged battery

Engine	)	13 to 13½	. . . . .	Low charge rate
Running	)	13½ to 15½	. . . . .	Alternator & Voltage
Above Idle	)			Regulator OK
	)	15½ or above	. . . . .	Voltage Regulator out of Adjustment

It is important for you to understand that the reading on the Battery Condition Indicator Dial is indexed from the TOGGLE TEST SWITCH POSITION REGARDLESS OF THE MASTER SWITCH POSITION unless it is in the "BOTH" position. When the Master Switch is in the "BOTH" position then the Battery Condition Indicator Dial will indicate BOTH BATTERY CONDITIONS NO MATTER WHICH WAY THE TOGGLE TEST SWITCH IS INDEXED. When the Master Switch is in either the "OFF", "BAT 1" or "BAT 2" positions, the meter will read the condition of the battery TOWARDS which you index the Toggle Test Switch. Note that panel and meter illumination is also provided by this same Toggle Test Switch.

Before activating the electrical system, check the condition of both batteries and then select the STRONGEST BATTERY FOR ENGINE STARTING. Index the Master Switch to the strong battery, operate the BLOWER FOR FIVE MINUTES, and then start your engine. It will usually require about 15 to 30 minutes of engine running time to bring the starting battery back up to charge. Check the ammeter to assure that charging

4-1.1 BATTERY CONDITION INDICATOR (continued)

is normal and when the selected starting battery has been restored it is placed on reserve by switching to the other battery so subsequent charging and accessory loads will be confined to this second battery. IT IS GOOD PRACTICE TO BRING THE FIRST SELECTED BATTERY UP TO FULL CHARGE BEFORE PUTTING IT ON RESERVE AND CHANGING TO THE SECOND BATTERY.

Use the Master Switch in "BOTH" position ONLY for emergency starting when both batteries are near full charge. When both batteries are completely charged, transfer to either battery, keeping one battery always in reserve. This is especially important when you realize that there is no way to start your inboard engine with a dead battery, like pushing a car when you're in the same predicament!!

NEVER MOVE THE MASTER SWITCH TO "OFF" WHILE THE ENGINE IS RUNNING OR THE ALTERNATOR DIODES MAY BE BURNED OUT.

4-1.2 OPERATION OF CIRCUIT BREAKER ELECTRICAL SYSTEM

Accessory loads may be selected as desired by indexing the appropriate panel breakers "ON" so current may flow from the switched battery to the accessory. A branch circuit overload will cause the accessory circuit breaker to "trip", i.e., the breaker will automatically open the circuit and its handle will flip to the "OFF" position. After correction of the fault, the breaker may be manually indexed "ON".

The RUNNING LIGHTS switch activates the recessed red and green lensed lights forward and the white, 12 point stern light aft. The COMPASS LIGHT connection for the cockpit is also on this switch. When under sail at night, these are the only lights that should be shown, except for the shining of a white light on the sails if you feel there is a real need for greater recognition. [All] running lights use a GE90 bulb.

Bow

STERN RUNNING GE 1416

MAST HEAD HELLAMARINE 86A 002 600 - 121

4-1.2 OPERATION OF CIRCUIT BREAKER ELECTRICAL SYSTEM

The BOW LIGHT switch is for the 20 point white light on the mast and is to be used in conjunction with the running lights WHEN UNDER POWER OR WHEN MOTOR SAILING. It also serves as a quick way of illuminating the jib at night to check its trim and in emergency cases when recognition is important. This light will use a GE-90 bulb if replacement is necessary.

The cabin lights have their own individual switches, but must be activated by the CABIN LIGHT switch on the Master Power Control Panel. The bulb for these round dome lights is a [W-1141.] If the cabin lights start getting dim, this is fair warning that the battery needs a charge or is getting old. Remember that you have an automotive type battery whose charge and water level must be checked at least once a month. If your boat is to be unused or stored for extended periods of time it is advisable to remove the battery(s) and store in a warm, dry location.

90W

Periodically check all wires, connections, and terminals for loose connections which may cause electric sparks or power loss. This is especially important with the engine wires. When leaving the boat, FIRST TURN OFF THE ENGINE, THEN INDEX THE MASTER SWITCH TO OFF.

4-2 OPTIONAL ELECTRICAL ACCESSORIES

4-2.1 LIGHTNING GROUND

If optional lightning protection has been provided it will consist of #8 9x21 stranded wire connecting the uppers, headstay, or backstay chainplates to a common point on one of the keel bolts.

4-2.2 MAST HEAD LIGHT

This 32 point white light meets the international and inland rules for a light to be used when at anchor. It has a GE-68 bulb and would be activated by the masthead light switch.

4-2.3 110 VOLT SHORE POWER

When the optional shore power cord is plugged in, a Circuit Breaker Switch brings 110 volt AC current to the duplex outlets below and is located on the Accessory Control Panel. If there is any short or improper connection in the system the Circuit Breaker Switch will "trip", i.e., the breaker will automatically open the circuit and its handle will flip to the "OFF" position. After correction of the fault, the breaker may be manually indexed "ON" and your 110 volt A.C. appliances will work again. Be sure that all 110 volt A.C. appliances, other than lamps, have adequate grounds or the moist atmosphere and wet feet can really increase the shock potential.

4-2.4 WIRING TUBE IN MAST

On all boats a 3/4" PVC tube is riveted inside the mast to provide a conduit for electronic mast head wires.

4-2.5 SPREADER LIGHTS

Two spreader lights are mounted on the bottom side of the spreaders and are very bright, therefore, they should only be used when not underway as they can temporarily blind the helmsman. They are used at anchor for boarding, debarking, and general illumination.

4-2.6 FOREDECK LIGHT

A single FOREDECK LIGHT is mounted on the forward side of the mast with the BOW LIGHT on top and the single Foredeck Light shining downward and forward. In many respects this is a better way of illuminating the foredeck without getting light into the skipper's

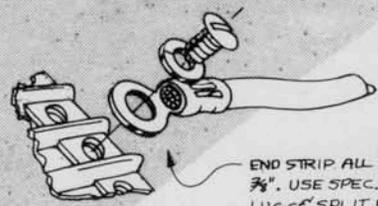
4-2.6 FOREDECK LIGHT (Continued)

eyes, is cleaner than lights hanging down from the spreaders and is one less fitting aloft to mess with! The bulb is a GE-212-1 and it is activated by the Foredeck Light Circuit Breaker on the Master Control Panel and the control switch on the engine control panel.

4-2.7 BATTERY CHARGER

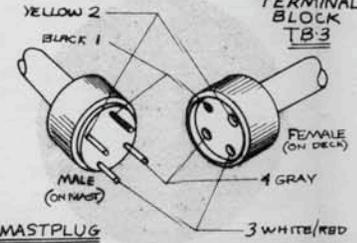
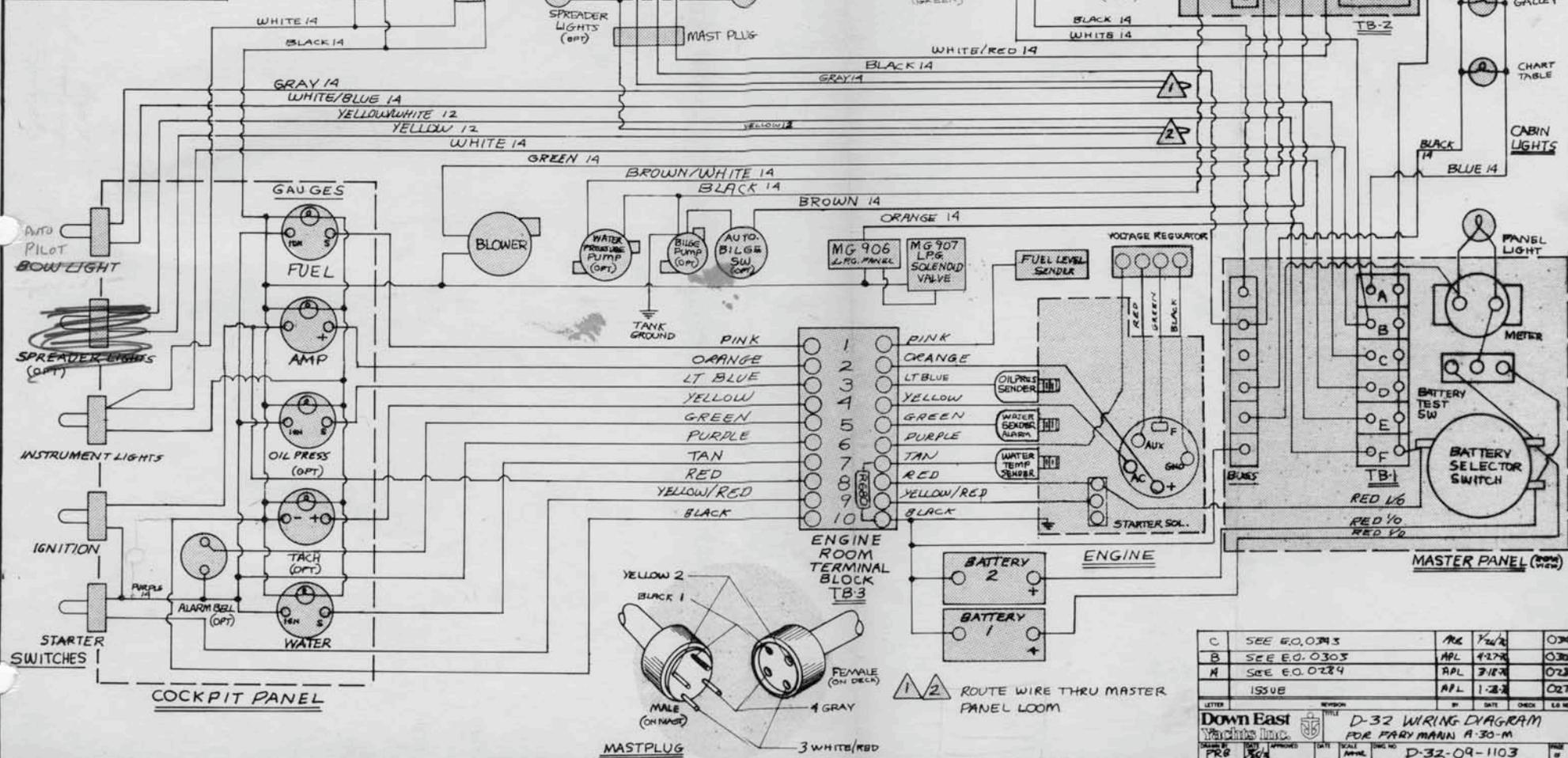
The optional battery charger we install is manufactured by LEWCO Electronics, 456 North Newport Boulevard, Newport Beach, California 92660, and carries a one year guarantee by the manufacturer. This silicon diode automatic battery charger has been especially designed for marine use in converting A. C. to D. C. current. The transformers in this unit incorporate isolated primary and secondary coils to prevent electrolysis and eliminate shock on the charging lines. Both the A.C. input and the D.C. output are fused for safety, while blowers or fans have been completely eliminated - thus eliminating any excessive servicing.

MASTER POWER CONTROL PANEL	
CIRCUIT BREAKER ASSIGNMENT	AMP RATING
A CABIN LIGHTS	15
B RUNNING LIGHTS	5
C BOW LIGHT	5
D BLOWER	10
E LIFE SAFETY CONTROL	5
F SPREADER LIGHTS (OPT)	5
ACCESSORY CONTROL PANEL (OPT)	
G SPARE (WATER PRESSURE)	15
H SPARE (BILGE PUMP)	15
I SPARE (ANCHOR LIGHT)	15
J A.C. OUTLETS	20
K A.C. WATER HEATER	10
L A.C. BATTERY CHARGER	10



END STRIP ALL WIRES 3/8". USE SPEC. ROUND LG-55 SPLIT RING LOCK WASHERS UNDER ALL LUGS.

BUTT CRIMP ALL WIRE



1 2 ROUTE WIRE THRU MASTER PANEL LOOM

C	SEE E.O. 0313	AK	Y/L	0313
B	SEE E.O. 0305	APL	4276	0305
A	SEE E.O. 0284	APL	3167	0284
	ISSUE	APL	1-23	0275

LETTER	REVISION	BY	DATE	CHKD	LG NO.
Down East Yachts Inc. D-32 WIRING DIAGRAM FOR PARY MANN A-30-M DATE: PKB 1/64 APPROVED: [Signature] DATE: [Blank] SCALE: [Blank] Dwg No: D-32-09-1103					

LOOM FROM MASTERPANEL TO MAST & BOW.

INDICATED BY:
CONSISTING OF:
 YELLOW 14GA = SPREADER LIGHTS.
 WHITE/RED 14GA = MAST TOP LIGHT (ANCHOR).
 WHITE/BLUE 14GA = BOW LIGHT.
 BLACK 14 GA = COMMON GROUND FOR MAST.
 BLACK 14 GA = NAVIGATION LIGHTS GROUND.
 WHITE 14 GA = NAVIGATION LIGHTS BOW (ANCHOR).

LOOM FROM MASTERPANEL TO CABIN LIGHTS.

INDICATED BY:
CONSISTING OF:
 BLACK 14GA = GROUND WIRE.
 BLUE 14 GA = HOT WIRE.
NOTE:
 WIRES RUN IN OVERHEAD THROUGH DECKBEAMS.

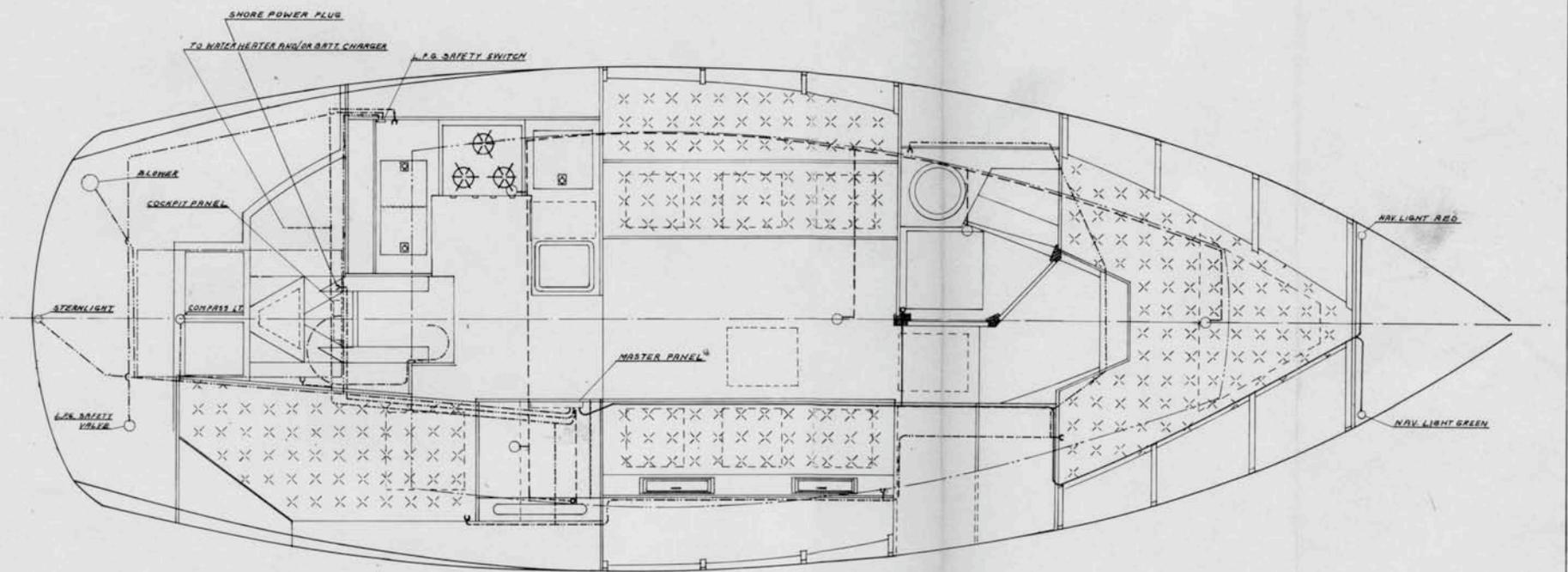
LOOM COCKPIT PANEL TO ENGINE

INDICATED BY:
CONSISTING OF:
 RED 10 GA = STARTER SOL. TO AMP METER.
 YELLOW 12GA = ALTERNATOR TO TACHOMETER.
 PINK 12GA = FUEL TANK SENDER TO FUEL GAUGE.
 BLUE 12GA = OIL PRESS SENDER TO OIL GAUGE.
 BLACK 10GA = COMMON GROUND TO PANEL.
 WHITE 10GA = STARTER SWITCH TO SOLENOID.
 ORANGE 10GA = ALTERNATOR TO AMP METER.
 GREEN 14GA = TEMP ALARM SENDER TO ALARM.
 TAN 14GA = TO WATER TEMP GAUGE.
 PURPLE 14GA = VOLT REGULATOR TO AMP METER.
 PURPLE 14GA = ALARM TO IGN SWITCH. *

NOTE:
 WIRES MARKED ASTERISK ARE NOT USED FOR STANDARD ENGINE A-30-M, 12 HP.
A.C. WIRING (OPT)
INDEX:
 # 12-3 WIRE = -----
 DUPLEX RECEPTABLE = ---C

LOOM FROM MASTERPANEL TO ENGINE ROOM & STERN.

INDICATED BY:
CONSISTING OF:
 BLACK 14 GA = GROUND FROM COCKPIT PANEL TO COMPASS LT & STERN LT.
 WHITE 14 GA = FROM NAV. LT. BREAKER TO NAV. LT. SWITCH TO INSTR. LTS., TO COMPASS LT & STERN LT.
 WHITE 12GA = FROM NAV. LT. SWITCH TO MAST LOOM.
 YELLOW 12GA = FROM SPREADER LT. BREAKER TO SPREADER LT. SWITCH.
 YELLOW 12GA = FROM SPREADER LT. SWITCH TO MAST LOOM.
 GREEN 14 GA = FROM MASTER PANEL BREAKER TO BLOWER.
 BLACK 14GA = GROUND FROM COCKPIT PANEL TO BLOWER.
 ORANGE 14GA = FROM MASTER PANEL BREAKER TO L.P.G. CONTROL PANEL TO L.P.G. VALVE.
 BLACK 14GA = GROUND FROM COCKPIT PANEL TO L.P.G. CONTROL PANEL TO L.P.G. VALVE.



ISSUE	REV	DATE	BY	CHKD	DATE
Down East					
D-32 WIRING PATHS					
D-32-98-104					

5-1 SAFE FUELING PRACTICES

1. Avoid fueling a boat at night or in rough water except in an emergency.
2. Before opening the fuel filling pipe inlet:
 - a. Extinguish all open flames aboard, including galley equipment.
 - b. Forbid all smoking on board or on the fuel dock. Drown all butts.
 - c. Turn OFF the main switch to be sure there is no live electrical circuit on board during fueling. (Do not turn OFF the main switch until the engine is stopped, to avoid damage to the alternator.)
3. Watch the fueling closely. Be sure that only a non-automatic, latch-open type of nozzle is used, compelling the operator's continuous hand pressure to keep fuel flowing, and that only the ordered quantity of fuel is put aboard. Insure that the operator maintains constant contact of nozzle to fill pipe.
4. When the desired quantity of fuel has been put aboard, make sure that the cap closing the inlet is tightly closed. Wash down any spills. Check the vent opening to be sure that no fuel is being discharged at this point.
5. If the boat is equipped with electrically operated bilge blowers (or gas detectors), turn ON the branch circuit switches which control the circuits to these devices and then turn ON the main switch. Permit blower to operate for at least five minutes and check the ventilation cowls for odor of fuel.
6. When your personal inspection and observation assure you that there are no fumes remaining in the boat, the engine may be started and full electric service restored as desired.

IF IN DOUBT, WAIT!

5-4 INBOARD ENGINES - GENERAL INFORMATION

After you read this section please look at STD-08-14210 in Section 5-5, which will have information relating to your specific engine's propeller shaft size, propeller size, and gear box reduction. Also be cognizant of the contents of your specific engine manual and the final part of Section 5 relating to your specific engine. What we want to cover here are some general operational instructions that pertain to the actual engine installation in your boat.

5-4.1 PROPELLER SHAFT ALIGNMENT

It is most important that shaft alignment be carefully checked at the time of launching by the selling dealer. The shaft and engine were carefully aligned at the factory but loading, trucking, and off loading can spoil this work, as well as the different set the hull may take in the water. This misalignment may also occur later and the following method is used to check and realign an engine and its propeller shaft.

1. Remove bolts holding the shaft coupling flange to the engine transmission flange and any flexible couplings.
2. Press coupling flanges together and check all around with feeler gauges for gaps between them. Zero to nine thousandths(.009) of an inch is tolerable.
3. If a greater gap exists between the top or bottom of the couplings, adjustment can be made by raising or lowering the front or back end of the engine using the adjustable motor mounts.
4. If a greater gap exists between the sides of the couplings, adjustment must be made by slacking off the engine mount lag bolts and prying the engine to one side or the other to close the gap.
5. When tolerance is satisfactory, re-tighten anything that has been slacked off and recheck for excessive gap. If it is still satisfactory, replace bolts in shaft coupling and tighten.

5-4.2 PROPELLER SHAFT PACKING GLAND

The Propeller Shaft Packing Gland Nut has been left loose at the factory so that water could thoroughly soak the packing at the time of launching. The Packing Nut was tightened by your dealer during launching to eliminate any excessive dripping and the

5-4.2 PROPELLER SHAFT PACKING GLAND (Continued)

Lock Nut tightened. When the engine is running and in gear there should be some drops of water coming out of the gland or else the packing nut is too tight and will burn up.

If the packing needs to be replaced, be sure you get SQUARE CUT WAX IMPREGNATED FLAX PACKING and that it is NOT WOUND AROUND THE SHAFT but cut to form three single rings which are "stacked" on the shaft so that the cuts are staggered.

5-4.3 FUEL TANKS AND ELECTRIC GAUGE

Our aluminum fuel tank is bonded to the hull with it's fill cap on deck and vent out the transom. It holds a total of 97 gallons and consists of an 82 gallon section and a 15 gallon reserve. When your gauge reads empty you have 15 gallons left. This installation conforms to the recommended practices set down by the American Boat & Yacht Council Project P-2-70. All fuel tanks bear an attached label in accordance with ABYC's P-2-70 recommendations, which states the following:

1. Manufacturer's name or trademark.
2. Date of manufacture - month and year.
3. Capacity in gallons.
4. Material of construction and thickness.
5. Fuel for which tank is approved or manufactured.
6. Maximum hydrostatic test pressure.

Each fuel tank has TWO FUEL CUT-OFF VALVES, one located directly on the fuel tank and another located directly on the engine with a fireproof fuel line between. This installation is in accordance with ABYC's P-2-70 recommendations.

When the valve handle is PARALLEL to the fuel line it is OPEN.
When the handle is at RIGHT ANGLES it is CLOSED.

5-4.3 FUEL TANKS AND ELECTRIC GAUGE (Continued)

If you have DUAL FUEL TANKS, follow the instructions below, which are the same as those on a metal plate mounted near your Master Control Panel.

DUAL FUEL TANK CONTROL PROCEDURE

1. Use main fuel tank first, before auxiliary tank, by opening lever valve marked "MAIN" and CLOSING lever valve marked "AUXILIARY".
2. Diesel fuel return line connects to the main tank only, so when using the auxiliary tank, fuel return line empties into main tank, providing a small emergency fuel supply after auxiliary tank is empty.
3. When switching from main to auxiliary tank while underway, open auxiliary lever valve for three minutes before closing main tank lever valve.
4. When a diesel engine is allowed to run out of fuel, air gets into the lines and injectors, which makes it impossible to restart without bleeding. To restart, switch from empty tank to full tank and bleed pump and injectors in accordance with the manufacturer's instructions. Then restart the engine. If it runs rough after a few minutes, stop engine and bleed again.

The Electric Fuel Tank Gauge has been adjusted to read EMPTY with 15 gallons of fuel in the tank. This has been done by bending the float arm on the sensor so that the float sits on top of the fuel when the electric fuel gauge is at the empty mark. You should never let a tank get this low for the obvious safety reasons. Also, a partially filled gas tank can result in water condensation, which is a major cause of sticky valves in a gasoline engine.

5-4.4 STARTING THE ENGINE

When STARTING THE ENGINE, double check your engine manual and Section 4-1.1 "Battery Condition Indicator", then:

1. Index the Master Power Switch to the strongest or starting BATTERY.

5-4.4 STARTING THE ENGINE (Continued)

2. OPEN THE ENGINE WATER INTAKE SEA COCK.
3. Check oil and fuel levels.
4. SHIFT LEVER IN NEUTRAL POSITION.
5. THROTTLE advanced about 1/4.
6. Push starter button. When engine starts adjust throttle to idle.
7. Check OIL PRESSURE. If pressure is LOW, STOP ENGINE and check oil level.
8. If water does not begin to flow out of the TRANSOM OUTLET in 2 to 3 minutes, STOP the engine and check WATER INTAKE SEA COCK.
9. If the alarm bell rings after starting, check water temperature and oil pressure gauges to determine which one is malfunctioning, then shut down engine and remedy the problem in accordance with the engine manual.

5-4.5 RUNNING THE ENGINE

When SHIFTING into forward or reverse run the engine at IDLE. SHIFTING from forward to reverse or reverse to forward should not be done at over 1000 RPM or the transmission can be damaged.

You will find your best cruising speed between half and three-quarters throttle. In smooth water, higher speeds can be obtained with higher RPM's but fuel consumption will increase accordingly!

5-4.6 SECURING THE ENGINE

1. Reduce RPM to IDLE, shift into NEUTRAL and pull the stop cable handle.
2. To reduce the drag of a propeller while sailing, the standard, two blade solid prop should have it's blades VERTICAL while the

5-4.6 SECURING THE ENGINE (Continued)

folding prop will have its blades HORIZONTAL. You should mark and align the PROPELLER SHAFT for its proper sailing position and then shift into forward to lock.

5-4.7 WINTERIZATION

In all boats with inboard engines that are shipped to areas that have below freezing temperatures, the cooling system has been winterized by utilizing an approved anti-freeze. There have been some cases of the water pump impellers being damaged by certain coolants, so we recommend the following brands:

DOWGUARD	PERMA-STA	SMITH BLUE CO.
HUBBARD HALL	PERMAGUARD	TELAR
PEAK	ZEREX	PRYO-PERMANENT

Also, remember that the water tanks, head, and water lines must be drained of water if below freezing temperatures are anticipated.

5-4.8 PROPELLER/ENGINE DATA

<u>BOAT</u>	<u>ENGINE</u>	<u>SHAFT</u>	<u>2 BLADE PROP</u>	<u>3 BLADE PROP</u>	<u>PARRY NUT</u>
DE 32	A-30	1"	15 X 10 RH	14 X 10 RH	3/4-10 RH
	R-30	1"	15 X 12 RH	14 X 14 RH	3/4-10 RH
DE 38	R-30	1"	16 X 12 RH	16 X 11 RH	3/4-10 RH
	S-30	1"	16 X 14 RH	16 X 13 RH	3/4-10 RH

5-4.9 KEEPING YOUR FUEL SYSTEM CLEAN

Certain bacteria and fungus growths thrive on diesel fuel when moisture is present. The fuel tank in your boat can provide a favorable environment for them since moisture saturated marine air can get through the air vent and condense to water inside the tank. The combination of darkness, water and diesel fuel readily promotes growth and eventually organisms can clog filters, pumps and even injectors.

Besides clogging the fuel system the growths introduce unburnable microscopic solids which can get past filters and cause smoking and inefficient combustion. There are also natural resins, gums and tars in diesel fuel, especially that found in some foreign ports, which can cause the same inefficiency. And water itself in sufficient quantity to get past filters inhibits combustion.

To properly maintain your fuel system it is wise to use fuel additives which inhibit bacterial and fungal growth and improve combustion.

Most fuel docks carry additives but if yours doesn't you may obtain them from the following sources:

APOLLO CHEMICAL CORP.
35 South Jefferson Rd.
Whippany, NJ 07981

"SDI-35"
bactericide

J. H. WESTERBEKE CORP.
Avon Industrial Park
Avon, MA 02322

"Dieselife"
bactericide and
combustion enhancer

SULLIVAN CHEMICAL CORP.
1470 West 9th St.
Long Beach, CA 90813

"Sul Kem"
bactericide and
combustion enhancer

UNITED STATES AVIEX CO.
1056 Huntley Rd.
Niles, MI 49120

"Kleer Flame"
combustion enhancer

U.S. BORAX AND CHEMICAL CORP.
3075 Wilshire Blvd.
Los Angeles, CA 90005

"Biobor JF"
bactericide

When cruising in foreign countries be sure to carry a good supply of additives.

FARYMANN DIESEL CORPORATIONSALES AND SERVICE

<u>Maine</u>	Wayfarer Marine Corp. Sea Street Camden, Maine	(207)236-4378
<u>Rhode Island</u>	Stokes Marine Supply 740 York Avenue Pawtucket, Rhode Island 02861	
<u>Connecticut</u>	Scofield Boatyard Mariner's Lane Stamford, Conn. 06902	(203)348-7771
	Carl Althen Essex Road Westbrook, Conn. 06498	(203)399-6957
<u>New York City</u> <u>New Jersey</u>	Farymann Diesel Corp. 1592 Hart St., P.O. 189 Rahway, New Jersey 07065	(201)381-6767
	Somers Point Marina Bay & Pleasant Avenues Somers Point, N.J. 08244	(609)927-2112
	Cove Sail Marina 1250 Ocean Ave., Box 313 Sea Bright, N.J. 07760	(201)842-5319
	Watson Marine Engine Service Town Dock Road New Rochelle, New York 11520	(914)235-4564
	Mid-East Marine & Indus. Corp. P.O. Box 223 Rio Grande, N.J. 08242	(609)884-3344
<u>Long Island, N.Y.</u>	Sterling Harbor Shipyard Manhasset Ave. Greenport, L.I., N.Y.	(516)477-0828
<u>Maryland</u>	Chesapeake Marine Engines 751 Panther Court Millersville, Md. 21108	(301)987-0370
<u>Virginia</u>	Henry & Henry 4014 Stonewall Avenue Fairfax, Va. 22030	(703)273-2463
	Norfolk Shipbuilding & Drydock Corp. Southern Yacht & Engine Ctr. Div. Norfolk, Va. 23504	(804)625-5711

Florida Eastcoast

M. D. Moody & Sons, Inc. (904)737-4401
4652 Phillips Hwy., Box 5350
Jacksonville, Florida 32207

Harmeyer Deutz (305)582-4645
1109 7th Ave. North
Lake Worth, Florida 33460

Complete Yacht Service (305)462-6977
518 West los Olas Blvd. 462-4377
Fort Lauderdale, Florida 33312

Shore & Marine (305)945-3811
204 N. W. 4 Avenue
Hallandale, Florida 33005

Florida Westcoast

Otmar's Diesel Engines (813)366-0990
1242 N. Lime Avenue Otmar Junemann
Sarasota, Florida 33577

Collins Marine Electric (813)649-2770
1010 C 10th Avenue South
Naples, Florida 33940

California, Southern

Chas. E. Smith Co., Inc. (714)~~673-4780~~
~~505 31st Street~~ 754-1924
Newport Beach, Ca. 92663

Kettenburg Marine (714)224-8211
2810 Carlton Street
San Diego, Calif.

Marine Mechanical (805)642-7783
1640 Anchor Way
Ventura, Calif.

Stacy's Repair Service (805)772-2128
1173 Market Street
Morro Bay, Calif.

Diesel Power Assoc. (213)821-8837
4023 Del Ray Street
Venice, Calif.

California, Northern

Diesel Power Assoc. (415)761-3614
207 Harbor Way
So. San Francisco, Calif. 94080

Glasco Marine (408)295-8722
402 Bird Avenue
San Jose, Calif. 95126

<u>Alaska</u>	Northern Hydraulics 5773 Seward Hwy. Anchorage, Alaska	(907)344-5797
<u>Washington</u>	Precision Engine Specialists 570 Mercer Street Seattle, Wash. 98109	(206)284-0560
<u>Oregon</u>	I.D., Inc. 2355 N.W. Quimby Avenue Portland, Oregon 97210	(503)226-7966
<u>Great Lakes Area</u>	Industrial & Marine Supply Co. 22917 Dequindre Hazel Park, Mich. 48030	(313)566-1522 548-5444
<u>Canada</u>	Anchor In Marina Sheboygan, Mich. 49721	(616)627-6831
	Anthony Keets Marine, Ltd. Wheatley, Ontario, Canada	(519)825-4631
	Farymann Canada 88 Signet Drive Weston, Ontario, Canada	(416)754-4111
	Bay Haven Marina 1862 Ottawa Beach Road Holland, Mich. 49423	(616)335-5816
	Shumway Marine Foot of Genesee Street Rochester, N.Y.	(716)342-3447
	Bay View Marine 28051 South River Road Mt. Clemens, Michigan 48043	(313)468-4011
<u>Central States</u>	Hugo's Repair Service 1120 Ninth Street Great Bend, Kansas 67530	(316)793-8740
<u>Gulf Coast</u>	American Marine & Equipment Co., Inc. 4133 Jefferson Highway New Orleans, La. 70121	(504)831-1329
	Steiner Shipyard P.O. Box 72 Bayou la Batre, Al. 36509	(205)842-2688
	Newton's Spinnaker Shop 4303 Parkmead Seabrook, Texas	(713)334-1578

FARYMANN R-30

SUGGESTED MINOR on BOARD SPARE PARTS

<u>QUANTITY</u>	<u>PART NUMBER</u>	<u>DESCRIPTION</u>	<u>PRICE EA.</u>	<u>TOTAL</u>
1	0530.87.5.784	Injector		88.55
3	PM456	Fuel Filter	5.50	16.50
3	PH35	Oil Filter	5.88	17.64
1	1300	Alt. Belt		2.47
1	1250	Pump Belt		2.28
1	20-37	Impeller & Gasket		8.65
4	Delo 400	Oil	.90	3.60
2	Type A	Trans. Fluid	1.00	2.00
1	Bio Bar JF	Fuel Additive		16.00
2	0531.07.0.204	Injector Washer	.85	1.70
1	TRW Yellow	Paint		2.19

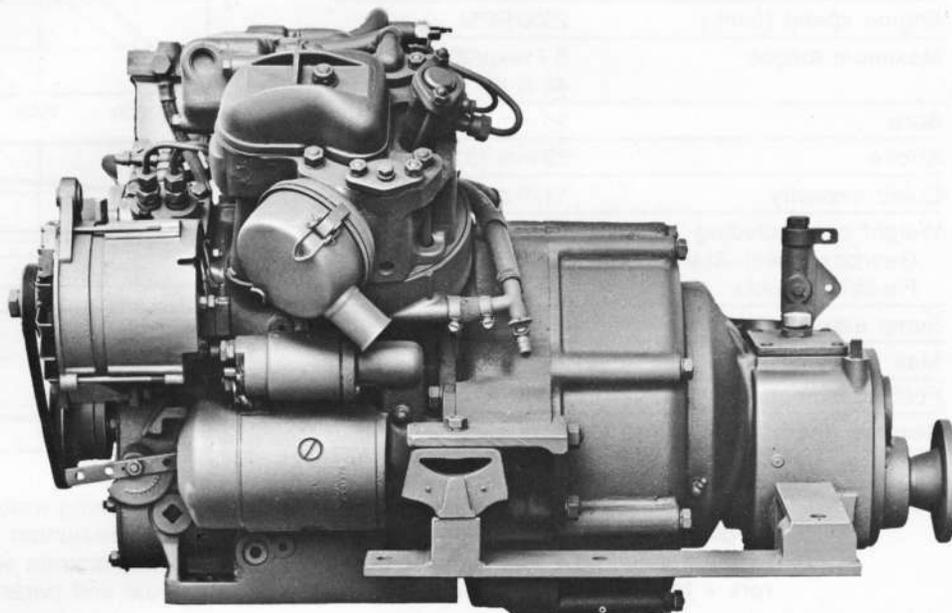
PRIMARY FRAM FUEL FILTERS AS APPLICABLE

2	CC1133PL	Fuel Filter Cartridge	5.10	10.20
2	CS1133PL	Fuel Filter Cartridge	5.35	10.70
2	CCS1136M	Fuel Filter Cartridge	11.48	22.96

July 5. 1977

Farymann Diesel

Marine Diesel Engine **R 30 M**



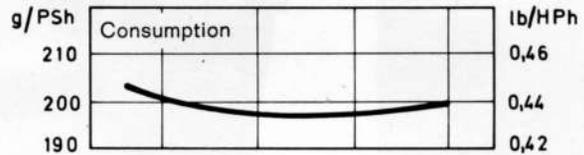
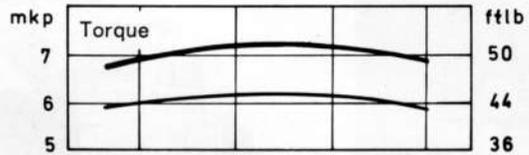
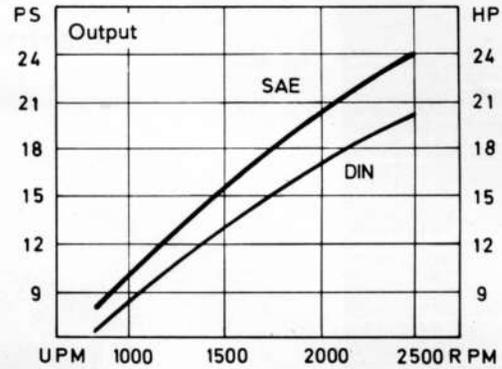
Continuous Shaft Output: 24 HP
Cubic Displacement: 1170 cm³
Engine Speed: 2500 RPM

Two cylinder four cycle marine diesel in V-configuration • Direct injection • Thermostat controlled seawater cooling • Reverse gearbox, reduction 2:1 • Specially tuned 2-point flexible marine mounts • Flywheel and ringgear fully enclosed • All service points at front end for easy maintenance.

Compact lightweight diesel power for safety and dependability, the ideal propulsion unit for sailing yachts and motorsailors • Corrosion-proof aluminium engine block • Unique cooling system with G.R.P. water jackets • V-configuration plus balanced crankshaft needs no additional counter-balancing device • Engine oil cooler and „Spin-on” type full-flow lube oil filter • Precision governor for lowest possible fuel consumption • Fuel filter and transfer pump with hand primer plus self-venting fuel system • Decompression lever and start-fuel button allow for easy hand-starting • Close circuit crankcase ventilation.

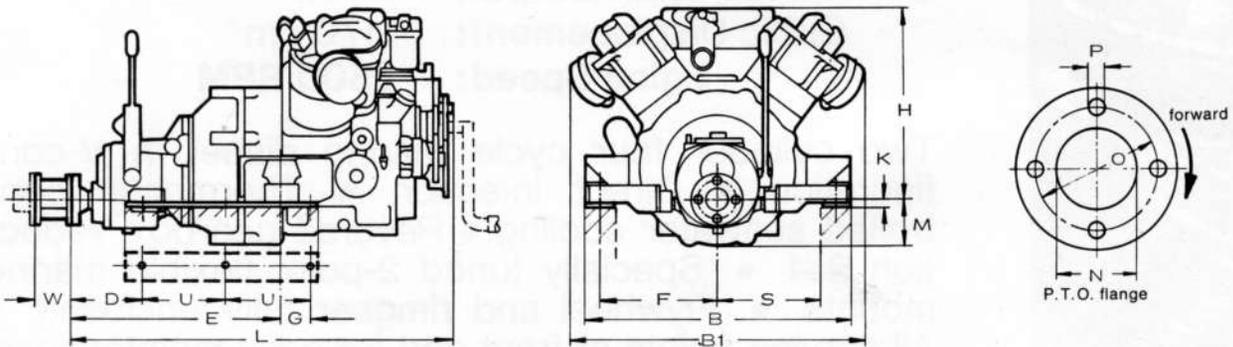
Farymann Marine Diesel Engine R 30 M

Engine Type	R 30/watercooled
Number of cylinders	2/V-configuration
Combust. System	4-cycle Direct injection
Valves	overhead
Output (continuous)	24 HP (SAE) 20 PS (DIN 6270)
Engine speed (cont.)	2500 RPM
Maximum torque	5,7 mkp/2000 RPM 42 ft lb
Bore	95 mm (3,74 in)
Stroke	82 mm (3,2 in)
Cubic capacity	1170 cm ³ (71 cu in)
Weight dry, including Gearbox, Elect.-Start, Flexible Mounts	192 kp (422 lb)
Sump capacity	2,3 ltr.
Max. angle	15° (27 %)
Fuel consumption	2,3 ltr/h (full load)
Reverse gearbox	Reduction 2 : 1



STANDARD Equipment: Engine in running condition including selfpriming waterpump and thermostat • oil-cooler • fuel filter • ringgear on flywheel • reverse reduction gearbox • watercooled exhaust manifold • fuel transfer pump • 2-point flexible mounts with ready-to-install bearings • tool kit • starting handle • maintenance manual and parts-list.

OPTIONAL Electric starter motor 12 V and marine alternator 420 Watts • panel with wiring harness • exhaust elbow with water injection • remote control for engine and gearbox • complete water intake and exhaust kits including hull fittings, hoses, seawater strainer, and water-lift silencer respectively • flexible shaft coupling etc.



	B	B1	D	E	F	G	H	U	K	L	M	N	O	P	S	W
mm	570	630	146	443	255	60	400	178	18	816	110	45	85	11	220	77,5
inch	22,4	24,8	5,7	17,44	10,04	2,35	15,74	7,01	0,70	32,13	4,33	1,79	3,35	0,43	8,66	3,05

Upon request: B1 = 555 mm (21,8")

Subject to modifications without notice.

Farymann Diesel 684 Lampertheim / West Germany • ☎ (06206) 2001 • ☒ 465710 farym d

Farymann USA

165 Charles Street
 NEW YORK, N. Y. 10014
 ☎ (212) 989-4466 • ☒ 222329
 Cables INCONIN-NEW YORK
 DIVISION OF MARINE SERVICE & MACHINE CO INC.

CHARLES E. SMITH CO., INC.
 505 31st St. - P.O. Box 1175
 Newport Beach, Ca. 92663
 (714) 673-4780

6 PLUMBING SYSTEMS

We have attempted to keep your plumbing system as simple as possible, especially where thru-hull fittings are concerned. Wherever possible water discharge is above the waterline and where two items can use a common below waterline thru-hull, this is accomplished. What follows then is a general description of the plumbing system, followed by a detailed Plumbing Diagram of your boat. You should become quite familiar with this system and constantly check it over to keep fresh water in your tanks and sea water outside of your hull!

In areas where below freezing temperatures are anticipated, the ENTIRE PLUMBING SYSTEM MUST BE DRAINED. It is extremely important for about one quart of a "permanent type" anti-freeze to be pumped into the ENTIRE MARINE TOILET. This is accomplished by removing the hose intake and pumping the anti-freeze through the system until it starts to run out the thru-hull opening. The thru-hull is now closed, the intake hose reattached and your marine toilet has been "winterized" until recommissioning. The addition of anti-freeze would be a good practice with other accessories where water may set or collect during a freeze.

6-1 THRU-HULLS AND THRU-HULL VALVES

All below the waterline thru-hull fittings are equipped with bronze seacocks. When leaving your boat for extended periods of time, safe practice dictates closing ALL of the seacocks EXCEPT those for the COCKPIT SCUPPERS. Periodically open and close these valves to make sure they are working properly. At this time also check all valves for seepage or leaks, tighten any hose clamps that might be getting loose and replace any defective hoses.

We cannot over emphasize the importance of these fittings, as fiberglass hulls with heavy keels don't float too well when filled with sea water.

6-2 FRESH WATER TANKS

A standard stainless steel fresh water tank is located amidships, thus keeping weight out of the bow, which improves the sailing characteristics of your boat. The fill is a deck plate located on the starboard side forward. Care must be taken so the VENT TUBE is not plugged or it will be impossible to pump water from this tank.

6-2 FRESH WATER TANKS (Continued)

The vent tube is located in the head behind the shower cover board.

When the optional additional fresh water tank is installed it is located adjacent to the standard tank under the sole, with the same type fill as the standard tank, but located on the starboard side amidships and with its own vent. The discharge lines for the two tanks come together and join under the galley sink where there is a "T" with a labeled lever type cut-off valve for each tank. In this case, use the bow tank FIRST, and then switch to the standard tank. Be sure to keep only the valve controlling the tank you are using OPEN and the other one CLOSED.

6-3.1 FRESH WATER HAND PUMP AND SINK

This high-output, foot lever type pump has a ball check valve to hold the vacuum on the return stroke. If the pump fails to operate after three or four strokes, first check the water tank and the air vent hole line. Tank FULL and vent CLEAR? If difficulty is still experienced, disconnect the intake hose at the pump and blow through to the tank to clear any possible blockage. Also check the hose as it could be kinked or have some heavy object squashing it closed. If the hose is clear and the pump still does not deliver water, disassemble the pump and look for particles blocking the internal check valve.

6-3.2 SALT WATER HAND PUMP

This optional pump operates the same way as the fresh water pump, but there are two schools of thought as to where the intake should be located. A serious racing skipper wants fewer holes in the bottom so he'll tie it into the sink drain while the more practical cruising man will have it on its own thru-hull! Since it's your option, you'll know where it is! DON'T tie into the engine cooling water intake. This will let air into the engine cooling system and cause the engine to overheat.

6-3.3 ICE BOX

Your iceboxes are insulated with a three inch, foamed-in-place, layer of polyurethane foam and should retain low temperatures over extended periods of time. SINCE THE ICE BOX DRAINS INTO THE BILGE, IT IS ADVISABLE TO CHECK THE BILGE BEFORE AND AFTER ALL OUTINGS.

6-3.3 ICE BOX (Continued)

In order to get the ice box as large as possible, the lower portion, and the drain, is BELOW the waterline. Thus it is not possible to drain to a thru-hull. Please remember that when a 25 pound block of ice melts you end up with about three gallons of water in the bilge!

6-4 HEAD

6-4.1 HEAD SINK

The situation here is the same as the GALLEY SINK (6-3.1), EXCEPT that both the LEVER VALVE and the Marine Toilet intake seacock must be open for drainage.

6-4.2 MARINE TOILET

Please be sure to read the "HEAD OPERATING INSTRUCTIONS" mounted on the bulkhead. For your convenience we will repeat these instructions here:

HEAD OPERATING INSTRUCTIONS

BEFORE USING

Make sure both thru-hull valves under the sink are open and that the lever valve below sink is closed. Raise lever forward of pump handle and pump slowly to partly fill and wet inside of bowl.

AFTER USING

Raise lever and pump until bowl is cleaned. Continue with at least 15 more strokes to flush discharge anti-syphon loop. Depress lever and pump slowly until bowl is empty. Turn lever valve under sink to open position so sink can drain.

IMPORTANT

WHEN NOT IN USE, LEVER ON HEAD FORWARD OF PUMP HANDLE MUST BE LEFT IN DEPRESSED POSITION TO PREVENT FLOODING OF BOAT. WHEN LEAVING BOAT FOR AN EXTENDED PERIOD IT IS ADVISABLE TO CLOSE BOTH THRU-HULL VALVES. DO NOT PUT ANYTHING THAT HASN'T BEEN EATEN OR TOILET PAPER IN THE BOWL AS THE VALVES CAN BE EASILY PLUGGED.

6-4.2 MARINE TOILET (Continued)

The SMALLER valve is the water INTAKE and HEAD SINK DRAIN, while the LARGER serves for DISCHARGE. The LEVER VALVE installed in the head sink drain hose MUST BE CLOSED when operating the toilet to assure an adequate water supply for flushing. Thus, to drain the head sink, this valve, and the INTAKE gate valve must be open.

It is possible to leave the two gate valves open while sailing, provided the internal "Joker" rubber check valve is not held open by refuse, and not have any water syphon back into the bowl. In extremely heavy sailing conditions, it would be prudent to keep these two valves closed.

Periodically add a small amount of liquid detergent and pump it through the system to lubricate the internal valve mechanism.

6-5 BILGE PUMPS

A MANUAL BILGE PUMP is standard because it is of higher capacity and more reliable than the electric type. It is mounted under a watertight cover.

For offshore cruising the pump is to be operable with all cockpit seats and hatches and all cabin hatches and companionways closed. With a boat load of water, and more expected at any moment, you don't want to be opening hatches or trying to get below to operate a bilge pump! Naturally the latter method is a more expensive installation, but really the only way to go, so this is how it would be mounted at the factory.

The factory installed optional ELECTRIC BILGE PUMP is connected to a switch on your Accessory Control Panel, which in turn is connected to its own Float Switch. In order to have your Electric Bilge Pump operate AUTOMATICALLY, the Master Switch and the Accessory "Bilge Pump" Switch must BOTH be on and water in the bilge must be high enough to raise the float more than two inches.

As with the manual bilge pump, it also discharges out the transom. This is probably the most important safety device you could have on board, for as long as the battery is charged, excess bilge water will automatically be pumped overboard.

6-5 BILGE PUMPS (Continued)

All factory installed bilge pumps have pick-up hose strainer bases and float switches secured to a "D" handle assembly which locates them in the deep sump aft of the keel, but allows the whole assembly to be lifted out of the sump for service.

6-6 HOT AND COLD PRESSURE WATER SYSTEM WITH SHOWER

This hot water system is operated either by running the inboard engine or on 100 volt A.C. Shore Power. You will note there is a plug on the hot water tank which must be plugged into the mating connector which connects it to the INTERNAL 110 volt A.C. system through a circuit breaker on the Accessory Control Panel marked "WATER HEATER".

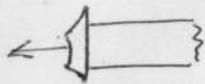
DO NOT TURN ON UNLESS THERE IS WATER IN THE SYSTEM AS THE HEATING ELEMENT WILL BE BURNED OUT IF THE TANK IS EMPTY.

When filling the system for the first time or refilling an empty system, you will have to bleed the air out of ALL WATER LINES. This is accomplished in the following manner.

1. Fill water tanks and turn ON ship's electrical system.
2. Turn ON the PRESSURE PUMP by activating the switch on the Accessory Control Panel.
3. Starting at the Galley Sink, turn ON the HOT WATER FAUCET. Expect nothing but air for the first few minutes as the Hot Water Heater must be filled before water will flow from the faucet.
4. As the Water Heater approaches full, water will start to pop and spurt from the faucet. Turn the FAUCET OFF.
5. Now turn the faucet ON and OFF slowly, with one hand under the spout. This will keep water from splashing about while the last bit of air is being removed from the heater and the galley sink hot water lines.
6. When a solid stream of water is flowing from the spout, turn the faucet OFF. The pressure pump will continue to run, and upon reaching about 25 psi will automatically shut off.

"QUEST" PLASTIC PIPE
(May be available through
Familiar Supply Co. in
San Gabriel, CA)

INSERT RING
"LOBSTER TRAP"
STYLE:



CONE GOES
ON FIRST,
THEN RING,
THEN CAP
FITTING -
FINGER TIGHT
+ 2 WRENCH TURNS

6-6 HOT AND COLD PRESSURE WATER SYSTEM (Continued)

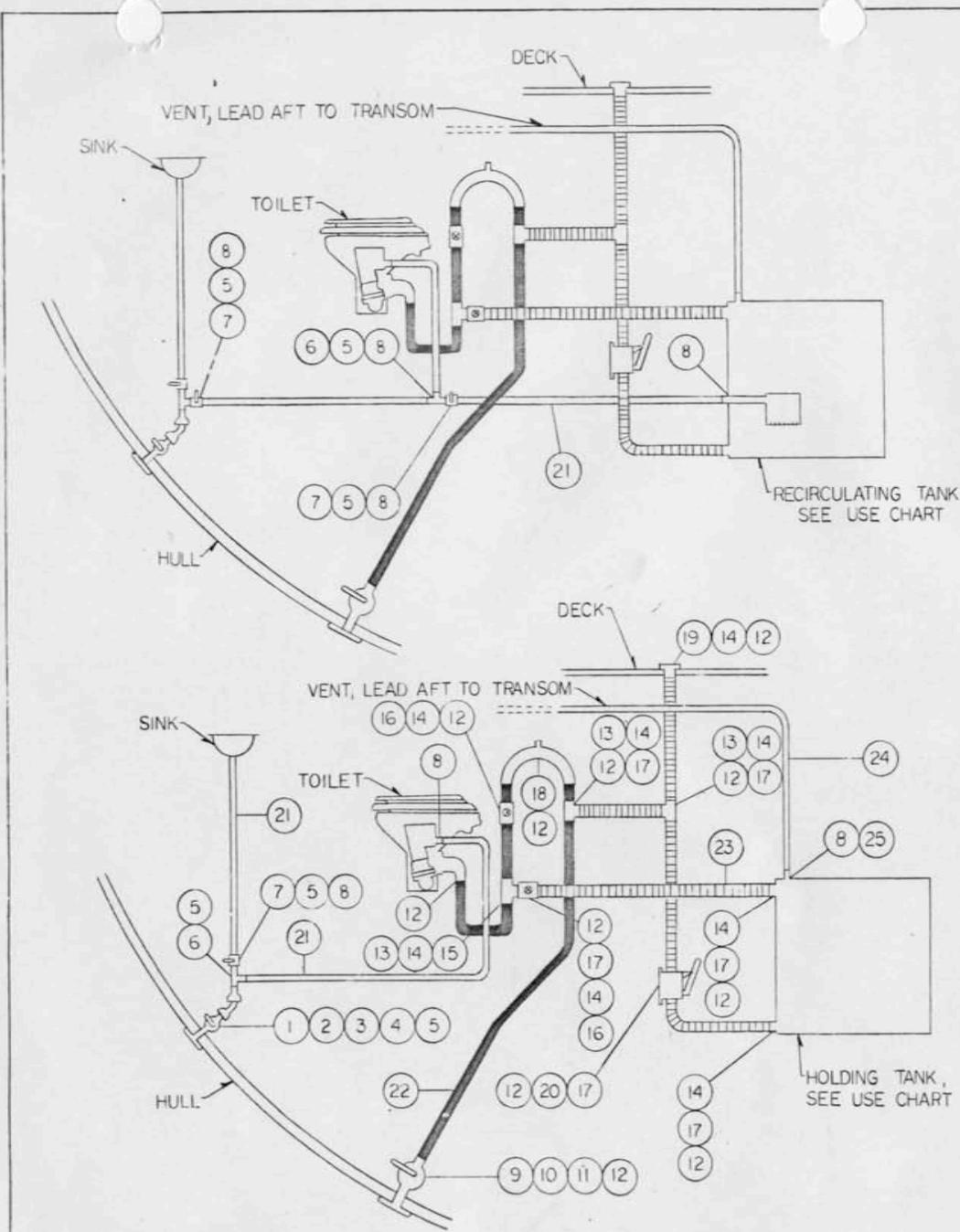
7. Now repeat this same procedure for the Galley Sink Cold Water Faucet, both faucets in the Head, and the Shower.
8. The system is now completely primed so top off the water tanks to replace the water that is now in the system.

The PRESSURE PUMP is a 12 volt D.C. unit that will start automatically when the pressure drops to 18 psi and will continue running until the pressure has been brought up to 25 psi. If the pump starts running wild:

1. Out of Water Fill system or switch tanks.
2. Leak in Lines Check plumbing.
3. Air Lock Bleed system.

Heat up time with ELECTRICITY will take about an hour and with engine water temperature at 180° F, about two hours.

Note that the SHOWER drains into the bilge and the AUTOMATIC BILGE PUMP will operate when the Master Switch and the Accessory Bilge Pump Switch are ON. This will serve as the shower sump pump unless there is a special switch mounted adjacent to the shower for this purpose.



BOAT	RECIRCULATING	HOLDING
D 32	R 120 KRACOR	OH- 258 INCA
D 38	R 120 KRACOR	H- 53 INCA
D 45 AFT	R 120 KRACOR	71025 KRACOR H- 113 INCA
D 45 FWD	R 252 KRACOR	71435 KRACOR H- 152 INCA

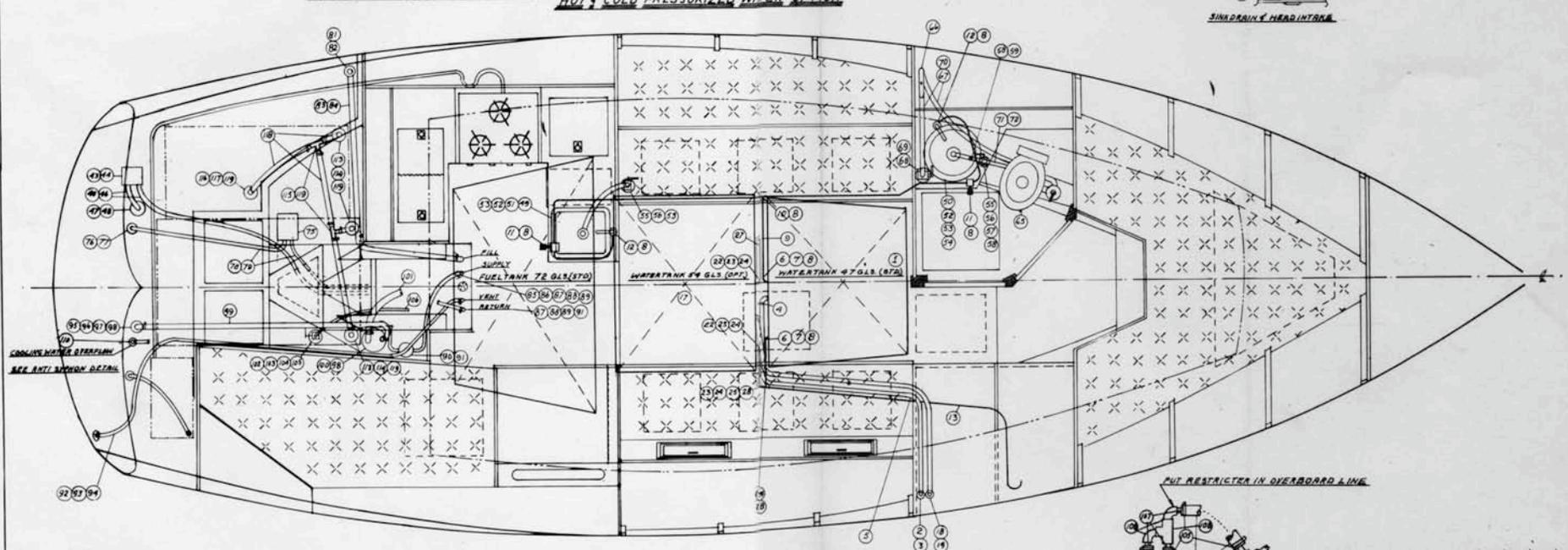
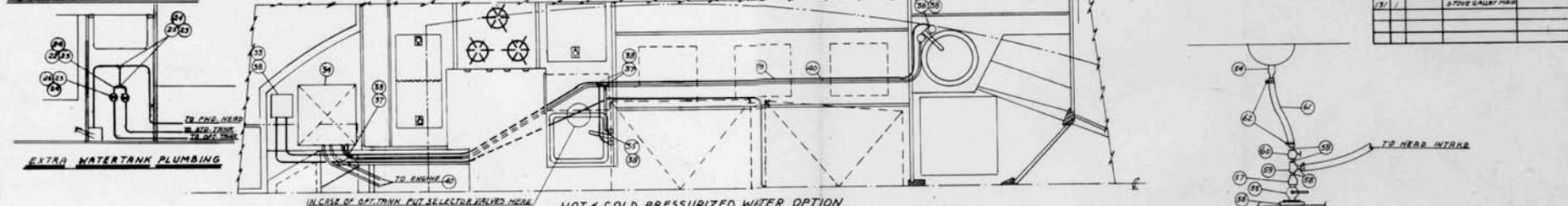
ITEM	QTY.	PT. NO.	DWG. NO.	DESCRIPTION	REMARKS
25	1EA			HOSE ADAPTER	PVC. 3/8 NPT X 3/8 BARB
24	FT	40907		HOSE 3/8	GREEN GARDEN
23	FT	44201		HOSE, U2 1 1/2	
22	FT			HOSE 1 7/8	
21	FT			HOSE 3/4	
20	1EA			PUMP, DIAPHRAM	WHALE GUSHER*8
19	1EA	33742		PLATE, DECK WASTE	BR. ELK
18	1EA			LOOP, VENTED 1/4	
17				CUFF U2 HOSE	
16	2EA			VALVE GATE 1/4	
15		40658		NIPPLE, CLOSE 1/4	BR
14		40719		HOSE ADAPTER	PVC. 1/4 NPT X 1/2 BARB
13	3EA			TEE 1/4	PVC.
12		40425		HOSE CLAMP*28	SS.
11	1EA	43933		ELBOW, ST. 1/4 X 45°	BR.
10	1EA	40809		SEACOCK 1/4	BZ WC 1565
9	1EA	43738		THRU HULL 1/4	BZ. ELK
8		40422		HOSE CLAMP*16	SS.
7		40794		VALVE, BALL 1/2	BR. 216G
6		40686		TEE 1/2	BR.
5		40647		NIPPLE, CLOSE 1/2	BR.
4	1EA	40707		BELL RED. 3/4 X 1/2	BR.
3	1EA	44073		ELBOW, ST. 3/4 X 45°	BR.
2	1EA	40807		SEACOCK 3/4	BZ WC 1565
1	1EA	43736		THRU HULL 3/4	BZ. ELK

ISSUE	MM	3-77	0406
LETTER	REVISION	BY	DATE
MM	507	NONE	STD-08-0200

Down East Yachts Inc. **HOLDING TANK INSTALLATION**
 DRAWN BY: MM 507 DATE: 5/67 APPROVED: NONE DATE: NONE DWG. NO: STD-08-0200 PAGE: 1 OF 1

FRESH WATER (STD)				EXTRA WATERTANK (OPT)				HOT & COLD PRESS. WATER (OPT)				SINKS & DRAINS (STD)				HEAD (STD)				ENGINE PLUMBING (STD)				ENGINE PLUMBING (STD) CONT.				COCKPIT DRAINS (STD)																
ITEM	PART NO	DESCRIPTION	REMARKS	ITEM	PART NO	DESCRIPTION	REMARKS	ITEM	PART NO	DESCRIPTION	REMARKS	ITEM	PART NO	DESCRIPTION	REMARKS	ITEM	PART NO	DESCRIPTION	REMARKS	ITEM	PART NO	DESCRIPTION	REMARKS	ITEM	PART NO	DESCRIPTION	REMARKS	ITEM	PART NO	DESCRIPTION	REMARKS	ITEM	PART NO	DESCRIPTION	REMARKS									
1	24402	WATERTANK		17	1	WATERTANK		33	44412	GALLERY SINK		46	44412	GALLERY SINK		61	40867	WC HEAD		81	33741	DECOR. (PURE)		97	40710	1/2" BALL COU		100	40427	#28 HOSE CLAMP		104	40823	2" BUNK DRAIN										
2	33740	DECK PLATE (W)		18	1	33740	DECK PLATE (W)	34	40880	WATER HEATER		50	40870	ROUND SINK		62	40882	1/2" VENTILATOR		82	40658	1/2" CLOSE HOSE		98	40427	#28 HOSE CLAMP		106	40823	2" BUNK DRAIN		108	40823	2" BUNK DRAIN										
3	40658	1/2" CLOSE HOSE		19	1	40658	1/2" CLOSE HOSE	35	44168	FRUCCET (STN)		51	1	1	1	63	40881	1/2" BALL VALVE		83	40232	1/2" RED HOSE	(REMARKS)	99	40903	1/2" BALL HOSE		107	40823	2" BUNK DRAIN		110	40823	2" BUNK DRAIN										
4	40425	#28 HOSE CLAMP		20	2	40425	#28 HOSE CLAMP	36	44030	FRUCCET (STN) & IERRA		52	40881	1/2" BALL VALVE		64	40808	1/2" SERVOCK		84	40640	1/2" CLOSE HOSE		100	1	1	1	101	44213	1 1/2" HOSE		111	40823	2" BUNK DRAIN										
5	40218	1/2" RED HOSE		21	10	40218	1/2" RED HOSE	37	1	1	1	53	40881	1/2" BALL VALVE		65	40808	1/2" SERVOCK		85	40640	1/2" CLOSE HOSE		101	2	44213	1 1/2" HOSE		112	40823	2" BUNK DRAIN		113	40823	2" BUNK DRAIN									
6	40425	#28 HOSE CLAMP		22	5	40425	#28 HOSE CLAMP	38	1	1	1	54	40881	1/2" BALL VALVE		66	40808	1/2" SERVOCK		86	40640	1/2" CLOSE HOSE		102	1	1	1	102	1	1	1	103	40714	BALL BEARING		114	40823	2" BUNK DRAIN						
7	40443	1/2" BALL VALVE		23	5	40443	1/2" BALL VALVE	39	22	40909	#28 HOSE CLAMP		55	2	40807	WC SERVOCK		67	40881	1/2" BALL VALVE		87	40881	1/2" BALL VALVE		103	1	40714	BALL BEARING		104	40443	1/2" BALL VALVE		115	40823	2" BUNK DRAIN							
8	40419	#8 HOSE CLAMP	W LEAVE 6"	24	8	40419	#8 HOSE CLAMP	40	28	40881	1/2" BALL VALVE		56	2	1/2" PLYM DONUT		68	40881	1/2" BALL VALVE		88	40881	1/2" BALL VALVE		104	1	40443	1/2" BALL VALVE		105	2	40419	#8 HOSE CLAMP		116	40823	2" BUNK DRAIN							
9	40809	1/2" BALL VALVE	W LEAVE 6"	25	2	40809	1/2" BALL VALVE	41	1	1	1	57	40707	1/2" PLYM DONUT		69	40881	1/2" BALL VALVE		89	40881	1/2" BALL VALVE		105	2	40419	#8 HOSE CLAMP		106	1	1	1	107	40823	2" BUNK DRAIN		117	40823	2" BUNK DRAIN					
10	1	1	1	26	2	40703	1/2" BALL VALVE	42	1	1	1	58	44147	1/2" CLOSE HOSE		70	40825	1/2" BALL VALVE		90	40825	1/2" BALL VALVE		106	3	40419	#8 HOSE CLAMP		108	1	1	1	108	1	1	1	109	40823	2" BUNK DRAIN		118	40823	2" BUNK DRAIN	
11	43467	1/2" BALL VALVE	W LEAVE 6"	27	4	40909	#28 HOSE CLAMP	43	1	40882	GUSHER (H) PUMP		59	44147	1/2" CLOSE HOSE		71	40825	1/2" BALL VALVE		91	40825	1/2" BALL VALVE		107	3	40419	#8 HOSE CLAMP		109	1	1	1	110	40823	2" BUNK DRAIN		119	40823	2" BUNK DRAIN				
12	43480	1/2" BALL VALVE	W LEAVE 6"	28	3	40907	1/2" BALL VALVE	44	1	40874	1/2" BALL VALVE		60	40874	1/2" BALL VALVE		72	40825	1/2" BALL VALVE		92	40825	1/2" BALL VALVE		108	1	40419	#8 HOSE CLAMP		111	1	1	1	111	40823	2" BUNK DRAIN		120	40823	2" BUNK DRAIN				
13	40807	1/2" BALL VALVE	W LEAVE 6"	29	1	40807	1/2" BALL VALVE	45	1	40850	1/2" BALL VALVE		61	40850	1/2" BALL VALVE		73	40825	1/2" BALL VALVE		93	40825	1/2" BALL VALVE		109	2	40419	#8 HOSE CLAMP		112	1	1	1	112	40823	2" BUNK DRAIN		121	40823	2" BUNK DRAIN				
14	1	1	1	30	1	1	1	46	1	40425	#28 HOSE CLAMP		62	40425	#28 HOSE CLAMP		74	40825	1/2" BALL VALVE		94	40825	1/2" BALL VALVE		110	1	1	1	113	40823	2" BUNK DRAIN		122	40823	2" BUNK DRAIN		123	40823	2" BUNK DRAIN					
15	1	1	1	31	1	1	1	47	1	40822	1/2" BALL VALVE		63	40822	1/2" BALL VALVE		75	40825	1/2" BALL VALVE		95	40825	1/2" BALL VALVE		111	1	1	1	114	40823	2" BUNK DRAIN		124	40823	2" BUNK DRAIN		125	40823	2" BUNK DRAIN					
16	1	1	1	32	1	1	1	48	1	1/2" PLYM DONUT		64	1/2" PLYM DONUT		76	40825	1/2" BALL VALVE		96	40825	1/2" BALL VALVE		112	1	1	1	115	40823	2" BUNK DRAIN		126	40823	2" BUNK DRAIN		127	40823	2" BUNK DRAIN							

W DELETE FOR NYC WATER OPTION



7 INTERIOR APPOINTMENTS

You can treat everything below decks just like a home interior. Your interior teak should be oiled occasionally with a quality teak oil such as "Watco" to maintain its "yacht like" appearance. For a more permanent finish, the teak should be varnished with a semi-gloss or rubbed effect varnish. Keep the boat well ventilated, especially the bilges and lockers, and watch out for dampness. Leaving a couple of 100 watt light bulbs burning below will usually take care of any sweating and reduce that "clammy" feeling, especially during the winter months or during times of damp fog. It's a good idea to leave the bunk cushions on their sides and open up the lockers if you plan to be gone awhile. It might not look very neat but it increases ventilation and allows everything to air out. Any time things get wet with salt water, rinse off with FRESH WATER as soon as possible and let dry thoroughly. The salt crystals retain moisture and the material will always remain damp until cleaned with fresh water. Air and sunlight are wonderful cleaners - bring the vacuum cleaner aboard and get the carpet, cushions, blankets, sleeping bags, etc., up on deck in the sunshine while the vacuum picks up below. Spring cleaning should take place periodically, not annually, to keep the interior clean and bright.

Most of the equipment below deck is covered in other sections of the manual, with the exception of stoves, refrigeration, and any other optional accessories that you have installed. We have included the Interior Arrangement drawings for your boat in Section 7-1, followed by any related information.

WINDOWS :



GO INDUSTRIES, INC.
COSTA MESA, CA. 92627
714/642-1194

PATENT #3,868,789

CUSHION FABRIC

HERCULON "SORESON"
PATTERN w/ "COIN"
COLOR

YELLOW FORMICA TOP

"HONEY" VELVET FINISH
BY WILSON ART
D-54-VF

7-3 LPG STOVE

LPG means liquified petroleum gas - popularly known as propane or butane. The tag on your stove indicates that it has been factory tested prior to shipping, in accordance with the Fire Protection Standards set down in the Boating Industry of America Manual. LPG, under moderate pressure, will liquify, and upon relief of pressure is readily converted into a gas. Due to this unique condition it is extremely important that the GAS BOTTLE be placed in an airtight, waterproof enclosure that is VENTED and DRAINED OVERBOARD. The LPG stove is extremely simple to operate BUT BE SURE TO FOLLOW THE INSTRUCTIONS ON THE PLAQUE MOUNTED NEAR THE STOVE. For your convenience we will repeat those instructions here:

LIQUIFIED PETROLEUM GAS, STOVE SAFETY INSTRUCTIONS

I TANK FILLING:

The LPG remote container must be removed from the boat and taken to an LPG filling station for filling.

II REMOVING TANK

1. Switch off solenoid valve.
2. Remove lid from LPG safety housing.
3. Make certain the manual service valve is closed.
4. Back off disconnect nut.
5. Remove container from housing. Be careful not to damage regulator pressure gauge.
6. Take container to LPG filling station and have filled to the legal liquid level capacity indicated on the container.
7. Replace and reconnect container in LPG safety housing.
8. Open manual valve and check system for leaks as follows:
 - A. With appliance valves closed, note pressure on the gauge.

7-3 LPG STOVE (Continued)

- B. Close container valve and if the pressure drops locate leakage by application of a liquid detergent and water solution to each joint until leak is located. Never use flame when checking for leaks. Fix leak by tightening joint and repeat test to insure that there is only one.
- C. When all leaks are fixed, close LPG safety container tightly. Leaving the manual valve open and the solenoid valve off.

III LIGHTING

1. Make certain that all burner valves are closed.
2. Turn on LPG solenoid valve.
3. Apply lit match to burner and open burner valve.

GENERAL SAFETY PRECAUTIONS:

1. Keep solenoid valve off when the boat is unattended and whenever stove is not in use.
2. Test system for leakage each time tank is refilled and twice a month between fillings.

MAGNA KOLD

MODEL 20-AD-HS

Section 7-4

SERIAL NO. 8977 12V 12 AMPS 1/8 HP

COSTA MESA, CA 92627 (1960 Model RVIA - "RALPH")
(714-631-2555)

7-4 MECHANICAL REFRIGERATION AND FREEZER (Mechanicold)

The mechanical refrigeration and freezer in this application is defined as a system run off the engine. The temperature is regulated manually, but there is a thermostat to prevent the refrigerator from becoming too cold. When either the refrigerator or freezer become warm, the engine is started and the system switched on and run until the freezer becomes cold. The running time will vary, depending on how long the temperature is maintained in the freezer.

The system is composed of the following components, which are also alphabetically indexed in the diagram on the following page.

- A. The compressor is a two cylinder automotive air conditioning type; mounted on the engine. The compressor pulley has a 12 volt electric clutch and is driven by two V belts off an auxiliary pulley on the engine. Belt tension is regulated by adjusting the compressor or adjusting an idler pulley.
- B. The condenser is plumbed into the engine raw water cooling system before the water enters the engine (or the heat exchanger in the case of a fresh water cooled engine).
- C. The Receiver incorporates a built-in drier and a sight glass to permit checking the amount of refrigerant.
- D. The Expansion Valves control the flow of refrigerant into the Evaporators.
- E. The Evaporator consists of tubing coils in an autetic solution such as "DOLE" cold plates.
- F. The Thermometers are mounted in a position so they can be easily observed and the element bulb in the box is about mid-height.
- G. A Switch to control the electric clutch may incorporate a red light to show when the switch is on.
- H. A High Pressure cut-off switch is provided to disconnect the electric clutch if the system pressure becomes too high, usually due to lack of cooling water.

7-4 MECHANICAL REFRIGERATION AND FREEZER (Continued)

Conventional refrigeration tubing and fittings are used with refrigerant hose between the compressor and the rest of the system to absorb vibration.

The operation of the system and the function of the components is as follows:

The refrigerant is piped to the expansion valves (D) from the receiver (C) as a liquid and the amount of flow is regulated by the temperature of its thermal bulb (F) attached to the outlet line of the evaporators. In the evaporators (E), the refrigerant picks up heat and is changed to a gas. The gas is piped to the compressor (A) where it is changed from a gas at low pressure to a gas at high pressure. This high pressure gas is piped to a condenser (B) where the heat is taken out by the engine raw water. This changes the gas to a liquid which is piped to the receiver (C) and the cycle continues. No adjustments are required, simply run the compressor (A) long enough to maintain the desired temperature.

The High Pressure cut-off switch (H) is an excellent safety device, as it prevents damage from excessive pressure due to lack of cooling water. This can be the result of a clogged inlet line, the thru-hull water intake valve accidentally left closed, or being heeled over far enough for the water intake thru-hull to be out of water.

The refrigerator temperature control can be adjusted to prevent too low a temperature in the box, which would freeze milk, vegetables, beer, etc. The Freezer can be run as long as desired without ill effects. This provides an excellent way of making ice cubes.

Additional information and replacement parts must be obtained from the original manufacturer: Boat Specialists, Inc., 2439 West Coast Highway, Newport Beach, California 92660. Phone 714/645-0901.

HILLERANGE INSTRUCTIONS

RULES FOR SAFE OPERATION AND INSTALLATION OF LP APPLIANCES

1. Read these Rules for Safe Operation carefully, as well as all enclosed information.
2. Check that all applicable state and local codes regarding installation have been followed.
3. Check that minimum clearances to combustible materials have been maintained.
4. When igniting the burners, have lighted match ready when the burners are turned on.
5. Never light matches in the vicinity if the odors of gas are noted.
6. A window or other air vent should be opened slightly while using the range with oven. Gas burner flames consume oxygen which has to be replaced to assure proper combustion.
7. Do not tamper with the burner orifices or change their size.

ASSEMBLY

Your new range is fully assembled with the exception of the burner grates, and grate clip holddowns. These will be placed on unit after range installation is completed.

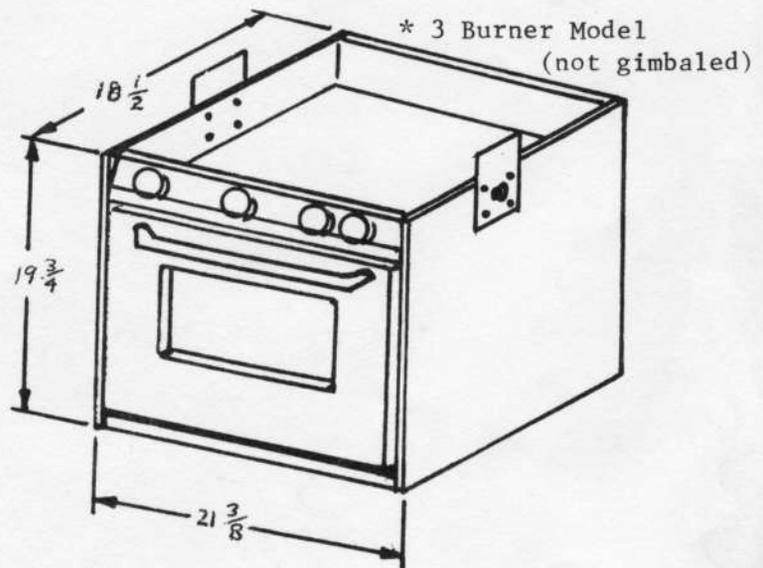
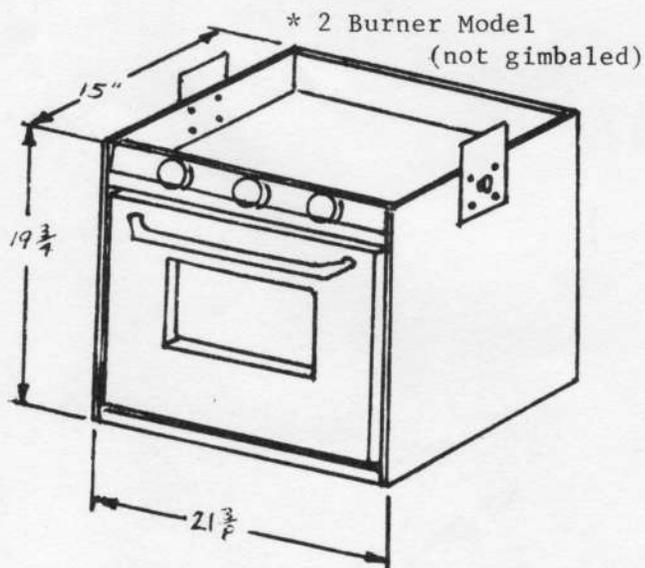
INSTALLATION: BUILT-IN MODELS

1. Consider the following when selecting the location for your range with oven:
 - a. Location of gas supply and routing of gas line.
 - b. Minimum clearances of unit from combustible materials. These clearances are:

2 Burner Range
Sides - 7 inches minimum as measured from center of closest burner head.
Rear - 9 inches minimum as measured from center of closest burner head.
Top - 24 inches minimum as measured from top of unit to bottom of any overhanging cabinet or shelf.

3 Burner Range
Sides - 5½ inches minimum as measured from center of closest burner head.
Rear - 7 inches minimum as measured from center of closest burner head.
Top - 24 inches minimum as measured from top of unit to bottom of any overhanging cabinet or shelf.
2. After selecting the best location, cut opening in countertop as shown.
3. Install gas supply and route gas line (not furnished) to range.
 - a. The gas tank must be located in a protected place and cannot UNDER ANY CIRCUMSTANCES be located below deck. Tanks should be mounted on deck in a vented overboard sealed container. Remember LP gas is heavier than air and if allowed to could drop to bilge and could cause an explosion. The supplier of the gas will be acquainted with the applicable codes with respect to the location of the gas supply tank.

- b. Gas supply line should be approved hose and should be routed in protected locations so as not to be damaged. A single continuous line is recommended.
 - c. No connections should be made in the gas line where the connections would be concealed after completion of the installation. All parts used in making connections must be of type acceptable for this purpose. Gas line should not make any sharp bends nor have any kinks. The line should not be under strain.
 - d. Install a manual shutoff valve in an accessible location in the gas supply line external to the range for the purpose of turning the gas on and off during servicing at least 3 feet from appliance.
4. Raise main top assembly, this will expose gas manifold on unit.
 5. Place unit in installation area.
 6. Secure in place with 4 No. 8 stainless wood screws.
 7. Make gas connection.
 8. After installing the gas supply and making all connections, check thoroughly for possible gas leaks. Turn the valves on your unit to their "off" positions. Open valve on gas supply tank. Using a soap and water solution, check each gas connection one-at-a-time by brushing the soap and water solution over the connection. Presence of bubbles will indicate a leak. Tighten fitting and recheck for leaks. If impossible to correct leak, replace fitting. UNDER NO CIRCUMSTANCES USE MATCHES OR FLAME FOR CHECKING LEAKS.
 9. Lower main top assembly in place. Place burner grates in place with the clips provided. Instructions are provided on the envelope in which the clips are shipped. These grate clips will hold the grate in place while boiling.
 10. Light the burner for testing.
 11. Your range with oven is now ready for use. Sometimes the burners will not ignite immediately and seem to "blow" slightly when they do ignite. This is usually due to the presence of air in the gas lines which will clear itself within seconds.
 12. It is a good idea to install a range lock at lower front corner to secure appliance when not in operation.



*On gimbaled installation be sure to allow for swing fore and aft.

OPERATING INSTRUCTIONS

To operate the oven in your HilleRange, please do as follows:

Turn the temperature control knob from the "PILOTS OFF" position to the "OFF" position. After this has been done, light the pilot in the oven (constant pilot).

After the oven pilot is lit, turn the oven temperature control knob to the desired temperature (example 350 degrees).

You will notice the constant pilot grow in size. It is now being used as a heater pilot. The heater pilot will heat the sensing bulb from the mercury control valve located in the rear of the range (back side). Once this sensing bulb has reached a sufficient temperature, it will open the mercury valve permitting it to release gas to the main burner.

When the oven has reached the desired temperature the thermostat will stop the supply of gas to the heater pilot and once again it will become the constant pilot, thus causing the sensing bulb from the mercury control valve to cool. The mercury valve will close and stop the gas supply to the main burner.

When the oven requires more heat, the same cycle will again repeat itself. The only time the oven will operate differently would be when the thermostat would be in the broil position. The main burner flame would then decrease in size and not shut off until the thermostat was turned down or to the off position.

CAUTION

1. Keep LP tank valves closed when boat is unattended. Close them immediately in any emergency.
2. Be sure all appliance valves are closed before opening LP tank valves.
3. Always apply lit match or other flame to burner before opening burner valve.
4. Close LP tank valve whenever appliance is not in use.
5. Test system for leakage at least twice a month and after any emergency in accordance with the following procedure:

With appliance valves closed and with LP tank valve open, note pressure on gage. Close LP tank valve. If the pressure drops, as indicated on gage this tells you there is a leak in the system. Locate leakage by application of liquid detergent or soapy water solution at all connections. After leak has been repaired, recheck system by repeating the above test.

IMPORTANT

The Oven Thermostat on this range is designed to enable you to turn off the Oven Constant Pilot by simply turning the Thermostat Dial to the "PILOTS OFF" position. When the dial is in this position you cannot light the Oven Constant Pilot. When the dial is in the "OFF" position the Pilot is on.

REMEMBER!!! It is always a good idea to have an approved ABC type fire extinguisher in the galley area.

I N S T A L L A T I O N I N S T R U C T I O N S

"OTTIE" LIQUID LEVEL SYSTEM

This unit has been pressure checked at completion of assembly to assure satisfactory operation upon installation. The following general instructions should be followed:

1. A 1¼" to 1½" hole is required in the top of the tank to accommodate the sensor probe head.
2. A 2 5/8" panel mounting hole is required for the 2½" gauge - a 2 1/8" hole for the 2" gauge. Both gauges are supplied with a "U" bracket to retain the gauge in the panel.
3. (a) For installation into a dry tank - both probe and gauge may be pre-installed prior to hooking up the 1/8" relay tube.
(b) For installation into a tank with liquid - the head of the probe must be kept above the liquid level until the probe and gauge are connected pressure tight with the 1/8" relay tube. The sensor probe can then be dropped into the tank and the mounting flange secured with the neoprene gasket between.

Five ½" self tapping sheet metal screws are supplied for use in most installations. A no. 30 size drill, or equivalent, should be used to pre-drill the five holes required.

4. Two basic type connection fittings are normally used:
 - (a) The compression fitting which consists of a compression "olive" and hex retainer nut. The nut is first slipped into the 1/8" tube - then the "olive", with the small end facing the end of the tube. Approximately 1/8" of tube should extend past the "olive". To get a pressure-tight connection - insert the tube and "olive" into the gauge or probe fitting and run on the hex retainer nut. A 3/8" open end wrench may be used to flare the "olive" and secure the nut. DO NOT over tighten as the compression "olive" can be damaged.
 - (b) The LF 3000 quick connect fitting requires only cutting the 1/8" tube to desired length - inserting tube into hole and pressing until it bottoms out. An "O" ring and collet lock the tube in place with a pressure tight seal.

INSTALLATION INSTRUCTIONS FOR "OTTIE" LIQUID LEVEL SYSTEM Cont.

To release the tube - press down on the brass center post and pull the tube free. To insure a good seal on reinstallation, about 1/4" should be cut off the tube end. A sharp razor, trim knife or our special cutter should be used for all tube cutting.

5. In the holding tank probe and on special fuel units a second 1/8" tube is installed for backflushing and recharging the sensor probe. This tube may be run to the control panel or cut off close to the sensor. When air is induced through this tube complete backflushing and recharging is accomplished. Any number of methods of inducing small amounts of air are available from squeeze bulbs to primer pump. Under NO CIRCUMSTANCE should an excessive surge of pressure be applied - gentle bubbling is all that is required.
6. Should the gauge not hold a constant reading - check for possible damage in the 1/8" relay tube or a loose connection at gauge or sensor fitting.

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8 ADDITIONAL MAINTENANCE TIPS

Maintenance of today's fiberglass sailboats is extremely simple when compared with the upkeep necessary to keep boats of other materials in "Shipshape and Bristol Fashion". Nevertheless, certain basic maintenance practices must be followed if the bright, sparkling, original appearance of your boat at delivery is to be retained throughout the years. Much of the maintenance information has been found in the foregoing sections where it related to specific items. In this section we will try to pick up any "loose ends" and try to answer any remaining questions on keeping your boat in a yacht-like condition. You can also keep up on new ideas with the boating periodicals. "Yachting's" annual Spring Maintenance issue is a good one.

8-1 RUDDERS, KEELS AND BOTTOM PAINTS

When your boat is not in use the tiller or wheel should be snugly secured to prevent the RUDDER from moving. This constant movement of the rudder shaft in the shaft bearings and packing box will result in unnecessary wear and, consequently, in excessive play or "slop". Also, a tiller banging around in the cockpit from wave and water action on the rudder could cause considerable damage. If the rudder action is stiff, a light grease such as "Lubriplate" should be used.

The instructions in Section 2-2.1 also apply for subsequent coats of BOTTOM PAINT and must be followed if you decide to paint an unpainted bottom at a later date. In this case, the bottom must be well sanded to remove all gloss from the gelcoat. After sanding, the entire bottom must be washed with whatever is recommended by the paint manufacturer, BUT NOT ACETONE, as any residue of acetone may react with the bottom paint and cause severe blistering.

While two coats are normally recommended for a good bottom job, it is a good idea to run a third coat for a distance of about 8" to 10" below the boot top. This area collects all the harborber scum and tends to get brushed harder and more often than the rest of the bottom so it can stand the extra coat!

8-2 SPARS, RIGGING, AND HARDWARE

The surface of your ALUMINUM SPARS is protected from corrosion by a tough polyurethane coating which is pretty much impervious to everything, but it is a good idea to wash it down occasionally with a good detergent soap and rinse with fresh water. It consists of a prime coat, two undercoats, and a gloss coat. This product is compatible with other paints if touch-up is required. ALWAYS keep the halyards tied away from the mast. Besides protecting the coated surface it does away with the din created by halyards slapping against the mast, which makes any anchorage sound like a tin can factory.

Periodically take a trip aloft to check the entire rig. Look for signs of chafe and check all nuts, bolts, screws, cotter keys, blocks, and masthead sheaves. Make sure the spreader tips are well covered with tape or leather to protect the sails from chafe and tearing. Take along a rag and bucket of fresh water to clean the rigging and mast on your way UP. A clean rig means clean sails! On your way DOWN, re-apply whatever protective coating you have decided to use on the mast and your work aloft is done - until the next time!

The halyards, sheets, and guys, along with all rope and wire splices, should be carefully checked before and after each sail for wear. Wire rigging must be examined for broken strands and signs of frayed sections. Particularly close scrutiny should be given to those sections which rest on sheaves. When sails are lowered, be especially careful not to pull down hard on the wire halyard. What happens is that the Nicropress thimble, which forms the loop for the dacron halyard tail, is jammed into the masthead sheaves and sheave spacer plates, causing dangerous chafe on the wire and dacron tail. The lines supplied with your boat are dacron, have little stretch, and wear very well if not abused. Sheets and vang often lead where they will rub together or chafe on lifelines. By adjusting leads or by applying inexpensive chafing gear, expensive damage may be prevented. When not in use, running rigging should be tied away from the mast or neatly coiled and hung in regular locations where it can readily be found. Frayed ends should be furled and whipped while chafed eye splices may be re-spliced following the instructions available from Samson Cordage Works, 470 Atlantic Avenue, Boston, Mass. 02210. All blocks, sheaves, turnbuckles, and winches used in conjunction with running rigging should be lubricated periodically with a light grease such as "Lubriplate" or sprayed with a protective film such as "WD-40".

8-2 SPARS, RIGGING, AND HARDWARE (Continued)

Why is my stainless steel rusting? Basically it is a galvanic action and you can prevent it with a cleaning rag! If you keep the stainless hardware on your boat free of marine growth and polished, it will last longer and look better. Saltwater sailors must hose off with fresh water after a hard, wet sail, and a rub down with a chamois helps. For a complete explanation on stainless steel in non-technical language, read John Fisher's excellent article in the January 1972 Boating magazine.

8-3 FIBERGLASS SURFACES

The glossy outer surface of your laminated fiberglass boat is known as "gelcoat", a polyester resin into which coloring pigments and weathering retardants have been incorporated. It should be hosed with fresh water after every outing and routinely washed with a good detergent. Use a sponge on the smooth surfaces, while a stiff deck brush will be helpful on the non-skid surfaces, followed by more fresh water to avoid streaking the topsides. Do not use abrasive cleaners as they will rapidly dull the gelcoat surface.

At least once a year the smooth gelcoat surfaces should be waxed and polished with a good automotive wax or a boat wax like Meguiar's Mirror Glaze, that is specially formulated for fiberglass surfaces. A power buffer will make work on the larger areas, like the hull, easier, but care must be taken not to cut through the gelcoat surface, particularly at corners and edges. Color in gelcoat, as in any material exposed to direct sunlight, tends to fade, dull, or chalk, and will require heavier buffing to bring back the original luster. For power cleaning use a LIGHT abrasive cleaner such as Mirror Glaze #1, while a heavier rubbing compound such as DuPont #7 may be used when polishing by hand. After buffing, wax and polish all surfaces EXCEPT THE NON-SKID AREAS.

Regardless of the amount of care lavished on your boat, occasional scratches, cracks, small gouges, along with a badly crushed section or even a large hole, are bound to appear. It is best to discuss the proper course of action with your local dealer or a professional who is SKILLED IN THE REPAIR OF FIBERGLASS SAILBOATS. Two excellent books are presently available that will give you the background information necessary to be knowledgeable in this area. How to Repair Fiberglass Boats is published by Ferro Corporation, One Erieview Plaza, Cleveland, Ohio 44114 at \$3.00.

8-3 FIBERGLASS SURFACES (Continued)

Another more definitive book, Fiberglass Boats: Construction and Maintenance by Boughton Cobb, Jr., is available through Yachting Publishing Corporation, 50 West 44th Street, New York, New York 10036, at \$3.00. We suggest you obtain a copy of Fiberglass Boat Care and Repair Manual by H. B. Fred Kuhls Company that gives some very good basic information. Minor gelcoat touch-up and patching is not difficult. It takes a little study, practice, and if possible, help from a knowledgeable person.

8-4 SAILS

Sails should be folded for storage whenever possible. This means always on small keel boats, and almost always on larger keel boats. If you leave the mainsail on the boom, always remove the battens and then flake it down carefully, with one person at each end of the sail so that the flakes are smooth and wrinkle free, before putting on the sail cover. Proper folding will help keep wrinkles out of sails and will prolong the life of the chemical fillers in the cloth which hold stretch to a minimum. Windows should always lie entirely within one fold to eliminate creases.

In a long race it is sometimes difficult to fold large headsails, so just stuff them loosely into their sail bags. After the race one of the first jobs is to wash off any salt water, dry and then fold these headsails by flaking them down in alternate folds, starting with the foot, with creases running parallel to the foot. If you remove the mainsail from the boom, fold the first flake so that the bolt rope is on the outside. The sail can thus be put back on the boom more easily next time you sail.

Hosing down sails with fresh water to remove salt is a good idea. Also, perhaps once each year, spread the sail on a soft surface, such as a good lawn, and go over it lightly with a very mild detergent and a very soft brush. Both practices comprise good maintenance. Pay attention to your sails and if any tears, rips, or worn spots appear on the corners, slides, or headboard, or stitching begins to chafe or has been caught and pulled to pucker the sail, make a note of the damage and its location. Many small tears and worn spots can be covered with tape until it is convenient to take the sail to a sailmaker for a professional repair job. (Non-porous white Johnson's adhesive tape is good.) Any rip at the edge of the sail, such as at the leech or foot of a genoa, must be fixed immediately. Tears here can spread quickly through the entire sail. Small holes in spinnakers can be covered with "Ripstop" and sewn until it is convenient to deliver to the sailmaker for a proper repair job.

8-4 SAILS (Continued)

Quite a lot is written about sails in any book on sailing, but three FREE publications should be especially valuable to you. Modern Sail Handling may be obtained from Ratsey & Lapthorn, Inc., East Schofield Street, City Island, New York 10464. The quarterly journal The Sailmaker from the Hood Loft, Marblehead, Mass. 01945, is a wonderful way of keeping up-to-date. McKibbin Sails, 1821 Reynolds Avenue, Irvine Industrial Complex, Santa Ana, California 92705, has The Illustrated Sloop which is a sail chart that will guide you to what sails to hoist for practically any point of sailing or wind velocity.

8-5 WOODWORK

The exterior and interior trim is teak, one of the most durable and decorative of all hardwoods - but it must be maintained to keep it from splitting and discoloring. Teak may be maintained in three ways:

Leaving the teak untreated and allowing it to weather naturally can cause splitting and a poor appearance. Bronze wool or fine sandpaper should be used periodically to clean the surface and a commercially available preparation such as Teak-Brite should be applied to combat the dull gray appearance of naturally weathered wood and help eliminate splitting.

A second way is to help teak maintain its natural color and life longer by treating regularly with a preparation such as Weldwood's "Wood Life".

-- C A U T I O N --

Never use steel wool instead of bronze wool or sandpaper. Small filaments of steel break off and cause rust spots that are very difficult to remove.

The third alternative for maintaining your exterior teak - varnishing - imparts the last word in a yacht finish but requires the most maintenance. However, for those who wish a "Bristol" condition yacht it is the only way to go! If you decide to varnish, be prepared to add at least one additional coat approximately every four months. If the teak has been "oiled" it must be cleaned by scraping and/or heavy sanding with #80 or #100 paper before sealing and varnishing.

8-5 WOODWORK (Continued)

While the teak still has its original color and texture, smooth with medium grit sandpaper (#120), dust the surface carefully and seal with a good sealer such as Brolite S-94 Clear Acrylic Sealer. Make sure you select a dry warm day, and do not seal or varnish much after noon as afternoon dampness will prevent proper drying and cause your varnish job to look discolored and uneven. Allow the sealer to dry at least overnight, then smooth the raised grain with #120 paper, dust carefully, and apply the first coat of a good quality spar varnish. The second and third coats are applied with at least a day's wait in between and sanding with #120 or #180, depending upon the roughness of the grain, will provide a minimum varnish covering for your exterior wood trim. Four or five coats are better, now sanding in between with #180 sandpaper, and several thin coats always result in a far superior finish to a lesser number of thicker coats. A good rub with a chamois after hosing down will keep the gloss and also lengthen varnish life.